University of Alberta

Managerial Goal Commitment in a Strategic Performance Measurement System: The Effects of Causal-Linkages and Non-Financial Goal Achievability

By

R. Alan Webb

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Doctor of Philosophy

in

Accounting

Faculty of Business

Edmonton, Alberta
Fall 2001

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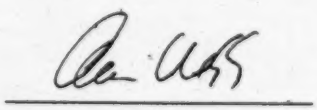

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This dissertation is dedicated to Wendy, Riley and Tanner who sacrificed so much without complaining, and to my parents, who have always encouraged me to achieve my goals.

ABSTRACT

This study addresses a recent innovation in management accounting: strategic performance measurement systems (SPMS). A SPMS is a set of causally-linked non-financial and financial objectives, performance measures and goals designed to align managers' actions with an organization's strategy. A central feature of a SPMS is the use of multiple difficult non-financial and financial goals to drive performance improvements. The focus of this study is managers' commitment to SPMS performance goals because research shows difficult goals are significantly more likely to result in performance improvements if individuals are committed to achieving them. A literature review and field interviews were used to identify two features of a SPMS expected to affect goal commitment: (1) the strength of the causal-linkages between the non-financial and financial objectives and performance measures (2) the achievability of the non-financial performance goals. Locke's (1968) goal theory was used to develop predictions.

An experiment, administered electronically, was used to test the predictions. 56 managers with an average of 19 years experience each completed 2 goal-setting scenarios. The variables manipulated were the strength of the SPMS causal-linkages between non-financial and financial measures and the achievability of the non-financial goals. Results confirm the majority of the study's key predictions. Managers' willingness to commit to non-financial and financial goals was significantly affected by both the SPMS causal-linkage content and the achievability of the non-financial goals. This study extends prior accounting research that has examined the behavioral consequences of accounting control system characteristics by demonstrating the impact of key SPMS features on goal commitment. It also extends the accounting literature that has focused on single goal-settings by examining managerial behavior in the more complex multi-goal setting of a SPMS.

ACKNOWLEDGEMENTS

First, I acknowledge the extensive contributions made by my dissertation chair, Michael Gibbins. His numerous suggestions, thoughtful advice and constant encouragement have been invaluable. Thanks to committee members Richard Johnson and Peter Tiessen for their many helpful comments and suggestions. I appreciate the participation of Judy Cameron, Karim Jamal and Marlys Lipe on my committees and their ideas for improving the dissertation. Special thanks to Carla Carnaghan, Murrary Lindsay, Steve Salterio and workshop participants at the University of Alberta, University of Saskatchewan, University of Waterloo, St. Mary's University and Wilfrid Laurier University for feedback on earlier drafts of the dissertation. I am also grateful for the contributions of Gary Brennan during the initial phase of the project. Thanks to the Social Sciences and Humanities Research Council and the University of Alberta for financial support.

Finally, I am indebted to my wife Wendy for her endless patience, unconditional support and unfaltering belief that we would make it to the finish line.

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CHAPTER 1

INTRODUCTION

The landscape of business is changing. In response to pressures brought on by deregulation, privatization, and global competition organizations are increasingly emphasizing the importance of strategy in developing and maintaining a competitive advantage (Nanni, Dixon and Vollman 1992). These changes in the business environment have brought about dramatic changes in management accounting over the past decade. Many profit-oriented companies, large and small, have recognized the deficiencies of using traditional, financial-based metrics as a means of guiding and evaluating performance (Atkinson, Waterhouse and Wells 1997). Now, more than ever, management accounting is venturing into non-financial, non-historical territory because many organizations recognize it is the non-financial factors that ultimately drive success in achieving strategic goals (Ittner and Larcker 1998a; Waterhouse and Svendsen 1998).

This study addresses a key aspect of the new management accounting: strategic performance measurement systems (henceforth "SPMS"). Following the work of Atkinson et al. (1997) and Nanni, et al. (1992), a SPMS is defined as: a set of causally-linked financial and non-financial objectives, performance measures and goals designed to align individual actions with the strategy of the organization. The purpose of a SPMS is to influence managerial actions and behavior by focusing attention on factors critical to the success of the organization (Rousseau and Rousseau 2000). A growing number of profit-oriented firms are adopting the SPMS approach and its proponents claim many benefits including better decision making, increased managerial motivation and improved

financial performance (e.g. Grady 1991; Rucci, Kirn and Quinn 1998).[1] Although the SPMS approach has received considerable attention in the practitioner literature, researchers are just beginning to examine the effects of using these systems (Ittner and Larcker 1998a).

SPMS proponents assert that a key benefit of the approach is its positive influence on behavior and decision-making (Kaplan and Norton 2000; Rousseau and Rousseau 2000). However, because so few studies have examined the behavioral consequences of using a SPMS little evidence exists to support or refute these claims. What little is known about the impact of a SPMS is based primarily on anecdotes from satisfied users of the approach. To address the knowledge gap, this study focuses on the impact of a SPMS on managerial behavior.

Because so little is known about the behavioral consequences of using a SPMS, a unique challenge was to identify the particular focus of this study from among the many possibilities. To that aim, an extensive literature review was undertaken and revealed a central feature of a SPMS is the existence of multiple, difficult non-financial and financial performance goals (Kaplan and Norton 2000; Olve, Roy and Wetter 2000; Otley 1999). If use of a SPMS is to drive financial performance improvements, a common reason cited by adopters, it is essential that managers be committed to achieving both the financial and non-financial performance goals. Research shows difficult goals are significantly more likely to lead to performance gains if individuals are committed to achieving them (Klein, Wesson, Hollenbeck and Alge 1999). Although goal commitment

---

[1] SPMS use is also found among non-profit organizations and governments (Kaplan and Norton 1996). However, a review of the literature suggests SPMS may be more common in profit-oriented firms seeking to implement strategic goals and drive bottom-line improvements. Accordingly, the focus of this study is on profit-oriented firms.

decisions in single goal settings have been the subject of considerable research, few studies have examined how commitment decisions are made in multiple goal settings such as a SPMS (Klein 1989; Vancouver 1997). Accordingly, the research question addressed by this study is: *what SPMS features affect managers' willingness to commit to the multiple goals it contains?*

The research question addressed in this study is consistent with a considerable body of accounting research that has focused on the effects of accounting control and information systems on managerial behavior. In studies dating back over 30 years (e.g. Lowe and Shaw 1968) researchers have long been interested in the impact of accounting control system characteristics such as leadership styles, budget participation, goal difficulty and incentive contracts on numerous behavioral variables including job attitudes, job-related tension, slack creation, motivation and role ambiguity (for a review see Shields and Shields 1998). Understanding how these behavioral variables are affected by control system characteristics is important given their potential impact on performance (e.g. Shields, Deng and Kato 2000). This study extends the literature by focusing on the impact of a SPMS on goal commitment, a behavioral variable with demonstrated importance in settings where difficult goals are used.

A literature review and a series of in-depth field interviews were conducted with senior and operational-level managers to identify features of a SPMS likely to affect goal commitment. The two key SPMS features expected to affect goal commitment that emerged from this process are: (1) the causal-linkages between SPMS non-financial and financial objectives and performance measures; and (2) the hierarchical SPMS goal structure. The causally linked non-financial and financial objectives and performance

measures is a defining feature of a SPMS. The linkages represent management's beliefs about the non-financial drivers of financial performance in the organization (Olve et al. 2000; Otley 1999). The theory proposed in this study is that the SPMS causal-linkage content can provide managers with information about where efforts should be focused to accomplish goals. A positive association is predicted between causal-linkage strength and commitment to the SPMS performance goals.

In a goal hierarchy, such as a SPMS, success in achieving the primary goals (financial) is contingent upon achieving the secondary goals (non-financial) (Vancouver 1997). Psychology and organizational theory research in single goal settings consistently shows a positive relationship between individuals' belief in the achievability of a goal and their commitment to that goal (e.g. Brown, Cron and Slocum 1998). Applied to the SPMS setting, managers' willingness to commit to the financial goals (primary) is likely to be affected by their beliefs in the achievability of the non-financial goal (secondary). The theory developed in this study predicts managers' commitment to the SPMS financial goals will be positively associated with their beliefs about the achievability of the non-financial goals.

An experiment, administered electronically (database and Internet versions), was used to test the predictions. Fifty-six managers with average full-time work experience of 19 years completed the materials. A mixed design was employed. The causal-linkage content of the SPMS was manipulated within subjects while the achievability of the non-financial goals was manipulated between subjects. Results show both independent variables had a significant effect on managers' goal commitment decisions.

This study makes several contributions to the accounting literature. First, it extends the body of accounting research that has examined the behavioral consequences of management accounting control system features. The findings demonstrate the importance of developing a SPMS with strong causal-linkages; results show that the content of a performance measurement system can have a significant impact on commitment to financial and non-financial goals. Second, previous accounting research has tended to focus on single-goal settings but this study examines goal setting behavior in a multi-goal setting where performance goals are causally linked. The results indicate managers' beliefs about the achievability of non-financial goals can significantly affect their willingness to commit to causally related financial goals. This highlights the need to calibrate the achievability of the entire *set* of SPMS performance goals. Finally, this is the first study to examine the mechanisms by which SPMS causal-linkage content and non-financial goal achievability affect goal commitment decisions. Results show that a carefully developed SPMS can raise managers' expectations for achieving goals and their beliefs about the attractiveness of those goals.

The rest of the paper is organized as follows:

- Chapter 2 describes the nature of a SPMS, the role it plays in managing an organization and the features likely to affect goal commitment. Research related to the design, use and consequences of a SPMS is also reviewed.
- Chapter 3 outlines the elements of the goal commitment framework.
- Chapter 4 develops predictions.
- Chapter 5 presents the research design including a discussion of: the participant selection process; dependent variable measurement; independent variable manipulations; and materials design and administration.
- Chapter 6 discusses the results of the hypotheses tests and Chapter 7 draws conclusions about the study's results.

CHAPTER 2

SPMS FEATURES AND RELATED RESEARCH

2.1 SPMS Features

Two steps were taken to identify the key features of a SPMS likely to affect goal commitment decisions. First, an extensive review of the SPMS literature was undertaken. Second, field interviews were conducted at two organizations in Western Canada. The two primary objectives of the interviews were to: (1) supplement the information about key SPMS features identified by the literature review; and (2) provide further descriptive information about the development and use of a SPMS. The next sections describe the following details about the interviews: the process used to select the organizations and descriptive characteristics about them; the interview participants and process; the nature of a SPMS; the role of a SPMS in managing the business; and conclusions about the key features.

2.1.1 The participating organizations

A representative of the Certified Management Accountants (CMA) of Alberta assisted in the identification of "for-profit" organizations suitable for the field interviews. The criteria established for the selection process were that the organization both: (1) utilizes a SPMS as defined in this study; and (2) has used the system long enough to allow interview participants to assess the consequences. Using the two criteria the CMA representative identified six potential organizations and made initial contact with each, broadly outlining the purpose of the study. The author conducted follow-up interviews with each contact person to ensure their organization met both criteria. The follow-up interviews ranged in length from 15 minutes to over 2 hours. Three organizations were

identified as unsuitable; one failed to meet the first criterion and two failed to meet the second. Of the remaining organizations, one declined to participate because of an internal reorganization that commenced after the initial contact.

The two companies that participated in the interviews are Syncrude and EPCOR. Syncrude, located in Fort McMurrary, Alberta, produces crude oil from oil sands and employs approximately 3,550 employees. At the time of the interviews, Syncrude had been using their SPMS for about 4 years. EPCOR is the parent company of Edmonton Power, Aqualta and Eltec, which together have about 1,400 employees. EPCOR had used their SPMS for 3 years at the time the interviews were conducted.

2.1.2 Interview participants and process

The company contacts agreed to identify four participants for the field interviews, two from the ranks of senior management and two from operational level management. Two participants were selected at each level recognizing that differing views may exist within an organization about SPMS details and consequences. Senior managers were included to provide insights as to why the SPMS was adopted and its impact. Operational level managers were included to provide evidence about key features of the SPMS and its consequences. The author reviewed the proposed participants with the company contacts and all were judged to be suitable. On average, senior management participants had been in their current positions for 7 years and with their companies for 14 years. Operational level management participants had been in their current positions an average of 4 years and with their companies 23 years.

All interviews were conducted on-site and the average length was about 1 hour (range 45 minutes to 100 minutes). With the prior permission of each participant, all

interviews were tape-recorded and later transcribed. A semi-structured interview format was used to meet the two objectives outlined above and the specific questions addressed in the interviews are shown in Table 1. The first two categories of questions (Table 1, "A" and "B") were designed to provide primarily descriptive information about SPMS features. The final category of questions (Table 1, "C") was designed to address the identification of key features.

2.1.3 The nature of a SPMS

Several versions of the SPMS approach appear in the literature including the "balanced scorecard" (Kaplan and Norton 1996, 2000), "integrated performance measurement" (Nanni et al. 1992), "strategic performance monitoring and measurement" (Waterhouse and Svendsen 1998) and "strategic performance measurement" (Atkinson et al. 1997). One of the organizations that participated in the field interviews described their approach as a "strategic business monitoring system". The other company referred to their approach as "aligning performance for results" or "Apfr" for short. Although, the literature review and field interviews reveal many ways to describe the systems, a common prescription for developing a SPMS emerges:

- Strategic goals are developed and agreed by senior management (Olve et al. 2000)
- Key "perspectives" are then identified (e.g. learning and growth, internal processes, customer, financial) (Kaplan and Norton 2000)
- Objectives are determined for each key perspective (e.g. improve efficiency of internal processes) (Nanni et al. 1992)
- Performance measures are established for each objective. Measures reflect causal links within and among key success factors; both non-financial measures (e.g. customer satisfaction) and financial measures (revenue growth) are employed (Atkinson and Epstein 2000)[2]
- Performance goals are set for each performance measure (Otley 1999)

[2] Financial performance measures may be used in perspectives other than "financial" but the literature review indicates non-financial measures dominate these categories.

While the development process appears to follow a similar pattern across organizations, differences exist. Companies vary with respect to the key perspectives used, the type and number of performance measures, and the linkage between performance on SPMS measures and rewards (Ittner and Larcker 1998a; Kaplan and Norton 1996). No template exists for determining content.

The preceding characterization of a SPMS is generally consistent with the descriptive evidence provided by the two organizations that participated in the field interviews. In each company strategic goals drove the process. Factors critical to the success of the company in achieving its strategic goals (or "key results areas") were identified (e.g. "people", "safety and reliability", "environment", "operational excellence"). Key objectives and performance measures, financial (e.g. "revenue growth") and non-financial (e.g. "customer index"), were then developed for each "critical" area. The non-financial objectives and performance measures were chosen primarily on the basis of whether management believed they were causally linked to financial performance. Difficult goals are set annually for key measures and each organization utilizes "scorecards" (objectives, measures and targets) at the business unit and department levels. One of the organizations has also rolled-out their SPMS to the individual employee level. Both organizations link managerial compensation with performance on key measures.

The SPMS literature suggests the process of developing and implementing a SPMS can be a lengthy process and the set of performance measures evolves over time. Rucci et al. (1998) report the implementation process at Sears occurred over a period of several years. Similarly, senior managers participating in the field interviews indicated

the design of the SPMS required considerable managerial effort. Senior and operational managers from both companies also noted the content of their SPMS has continued to develop and change over time. Far from being a quick "fix", development and use of a SPMS requires an on-going effort to ensure it reflects the changing needs of the organization.

2.1.4 The role of a SPMS in managing the business

According to Atkinson et al. (1997) a SPMS plays three roles in an organization: coordination, monitoring and diagnostic. The SPMS coordinates action, not by explicitly prescribing it, but by establishing objectives, performance measures and goals linked to the strategy of the organization. Managers must then identify the actions and initiatives needed to accomplish the performance targets (Ittner, Larcker and Meyer 1997; Kaplan and Norton 1996). According to successful adopters, the coordination role of a SPMS leads managers to better understand how their actions affect the achievement of strategic goals and results in a sharpened focus on the factors critical to the organization's success (Grady 1991; Rucci et al. 1997). Central to the coordination role is the causal-linkages among objectives and measures contained in the SPMS (Atkinson and Epstein 2000). In profit seeking organizations, non-financial objectives and measures are selected on the basis that they contribute to financial performance (i.e. profits) (Kaplan and Norton 1996). While the cause-effect linkages are unlikely to be strictly linear, they represent best estimates of the relationships that must be managed to achieve success.

Interview participants provided support for the coordination role of a SPMS. Senior managers at both organizations indicated a primary reason for adopting a SPMS was to focus managerial attention and effort on factors that affect the success of the

organization. According to many of the senior and operational managers, the SPMS has improved employees' understanding of both the company's strategic goals and how their actions affect achievement of those goals. Similarly, several operational managers suggested the SPMS clarifies what is expected from employees by clearly laying out performance measures and goals. However, some senior and operational managers cautioned that aligning action with strategic goals is problematic at lower levels in the hierarchy. Front-line employees may have a more difficult time connecting their actions with the financial success of the organization.

Feedback from the SPMS allows an assessment of progress towards achieving strategic goals; this is the monitoring role (Atkinson et al. 1997). By setting goals and monitoring results on SPMS measures, management can focus corrective actions on areas critical to the success of the organization. Given the causal-linkages inherent in a SPMS, determining the appropriate difficulty level and timeframe for non-financial goals is a particularly important issue (Kaplan and Norton 1996). Goals for the non-financial measures must be set at levels sufficient to achieve the financial goals but managers must believe those non-financial goals can be achieved. If managers do not believe the non-financial goals can be achieved, it may influence their willingness to exert effort in achieving the financial goals. Despite its importance, little is known about calibrating the difficulty of SPMS non-financial and financial goal levels (Otley 1999).

Interview participants provided support for the monitoring role of a SPMS. Operational managers indicated goals are central to the process; targets are set for all SPMS non-financial and financial measures. They indicated performance targets set at the corporate level drive the SPMS goal setting process. Operating divisions, departments

and teams set their individual SPMS goals in the context of the overall corporate goals. Most operational managers indicated non-financial and financial performance goals for their business units are difficult but achievable. Several senior and operational managers indicated timely feedback on key performance measures allows managers to follow-up on areas requiring attention. To enhance the timeliness of feedback, one of the participating organizations updates SPMS results on a daily basis. One senior manager indicated this approach allows them to react much sooner to problems when they occur.

Feedback from the SPMS can also play a diagnostic role (Atkinson et al. 1997). The use of an integrated set of performance measures allows assessment of the validity of the identified causal links within key "perspectives" factors (e.g. does customer satisfaction lead to greater market share?) and between "perspectives" (e.g. does development of innovative products result in more satisfied customers?). Performance feedback may suggest refinements to the causal links that must be managed and monitored to achieve the organization's objectives (Atkinson et al. 1997; Kaplan and Norton 2000; Nanni et al. 1992). Evidence indicates some organizations use their SPMS as a tool to develop a better understanding of the factors driving financial performance. Rucci et al. (1998) report that Sears undertook an extensive correlation analysis to determine the validity of the cause-effect SPMS relationships theorized by management. Consistent with this diagnostic role, one of the interviewees noted a key benefit of a SPMS is its role in providing feedback about the factors believed to affect business unit performance.

A final SPMS dimension often addressed in the literature is its role in the compensation and reward system. Evidence suggests many companies use performance

on SPMS non-financial and financial measures to evaluate and compensate managers (Ittner and Larcker 1998a; Waterhouse and Svendsen 1998). Although many companies seem to incorporate SPMS results in their reward system, approaches vary. For example, some organizations use a formula-based approach (e.g. weights are assigned to each measure) while others adopt a more subjective approach allowing senior managers more discretion in the process (Kaplan and Norton 1996).

Both organizations that participated in the field interviews link rewards to their SPMS. In both companies achievement of SPMS targets influences managers' performance evaluations and potentially their performance-based incentives. Neither company uses a strict formula-based approach, opting instead to allow senior management to exercise discretion in the evaluation process. Because of the sensitivity of incentive plans, neither organization was willing to elaborate on details of their systems.

2.1.5 Conclusions about key SPMS features

Based on the literature review and field interviews two features of the approach stand out as likely to affect goal commitment decisions. The first feature is the cause-effect relationships among the non-financial and financial objectives and measures contained in a SPMS. Unlike other multiple objective systems that have appeared in the past (e.g. management by objectives) the content of a SPMS articulates managements' beliefs about the drivers of performance in an integrated framework of causally linked objectives and measures (Atkinson and Epstein 2000). A well-developed SPMS therefore provides information about the factors affecting the organization's success. The means by

which information relevant to task accomplishment affects goal commitment decisions will be addressed in Chapter 3.

The second feature of a SPMS likely to affect goal commitment decisions is the hierarchical nature of its goal-structure (Austin and Vancouver 1996). While the causal-linkage content of the SPMS identifies *what* non-financial objectives (measures) must be accomplished to achieve financial success, the related goals or targets define *how well* they must be done. Given the structure of a SPMS, an organization's success in achieving the financial goals ("primary") is contingent upon its ability to achieve the non-financial goals ("secondary"). Given this goal structure, a manager's willingness to commit to a SPMS financial goal is likely to be affected by beliefs about the likelihood of achieving the non-financial goal. The theoretical basis for this linkage will be examined in Chapter 3.

The next section reviews research that has examined a variety of questions related to the implementation and use of a SPMS. Where relevant, findings from the field interviews will be integrated with the literature review.

2.2 Review of Performance Measurement Research

Accounting researchers have examined the impact of performance measurement and budgets on managerial behavior for many years and a considerable body of research exists. For example, Lowe and Shaw (1968) document the tendency of managers to set easier budgets when budget performance affects their compensation. Similarly Merchant and Manzoni (1989) examine factors considered by managers when setting the difficulty of their profit center budgets. Kenis (1979) finds attitudes towards the budget, job tension and motivation to achieve a budget are each affected by factors such as participation and

budget difficulty. Others (e.g. Brownell and McInnes 1986) have focused on the relationship between budget participation and performance. Although studies in this stream of research share a common focus on the link between budgets and behavior, they do not examine systems consistent with the definition of a SPMS used in this study.[3] Instead, they have usually focused on single-goal settings, which lack the complexity of a SPMS.

2.2.1 The behavioral consequences of using a SPMS

Only a few studies have examined the behavioral effects of using a SPMS. The evidence, based on field or case studies, indicates many SPMS users believe the approach leads to: a better understanding of corporate strategy; improved decision making; greater organizational commitment; and higher effort (e.g. Kaplan and Norton 1996; Rucci et al. 1998; Wruck and Jensen 1994). Ittner et al. (1997) report an exception to this trend. Based on a field study, they find SPMS adoption had little impact on managers' actions or their understanding of strategic goals. However the organization they examined had only been using their SPMS for one year and evidence suggests it may take longer for the benefits to emerge (Rucci et al. 1998).

Evidence from the field interviews corroborates some of the reported behavioral consequences of using a SPMS. Most of the senior and operational managers indicated their SPMS has led to a better understanding of strategic goals and the factors that affect their attainment. Most of the senior managers also indicated that the SPMS has resulted in an improved understanding and focus on factors driving financial performance in their

[3] The topics cited for this area research are not intended to represent an exhaustive review of the literature. Instead, the purpose is to acknowledge accounting researchers have long been interested in budgeting and goal setting issues.

organization. Two operational-level managers also pointed out a negative behavioral consequence of a SPMS. They suggested the increased ownership and accountability for achieving performance targets that accompanied their SPMS implementation has increased stress at lower levels in the organization.

2.2.2 Use of a SPMS in evaluating performance

A few studies have examined the use of a SPMS in evaluating performance. Schiff and Hoffman (1996) report senior managers use both financial and non-financial measures to assess the performance of departments and managers. Using an experimental approach, Lipe and Salterio (2000a) find that participants' evaluations of division managers are affected by outcomes on common measures but not by outcomes on unique measures. In a second study, Lipe and Salterio (2000b) show the organization of SPMS performance measures into categories (e.g. customer, process, etc.) affects participants' evaluations of division managers. Krumwiede, Eaton and Swain (1999) extend the literature in this area showing that: (1) highly controllable non-financial scorecard measures are more influential when evaluating managers; and (2) financial measures are given more weight when evaluating divisions. Krumwiede et al. (1999) also find participants rely more on non-financial scorecard measures that are consistent with the organization's strategy. Finally, based on field study data, Ittner et al. (1997) report that non-financial performance measures explain a significant portion of the variation in bank managers' performance evaluations.

2.2.3 Firm-Level Studies

The majority of performance measurement research has focused on firm-level issues. Several studies show organizational strategy affects the types of performance measures used. For example, Perera, Harrison and Poole (1997) find organizations with a customer-focused manufacturing strategy use more non-financial performance measures. Both Daniel and Reitsperger (1991) and Ittner and Larcker (1995) report that firms employing a quality strategy also use more non-financial performance measures. Similarly, in a series of field studies Wruck and Jensen (1994) find firms committed to a total quality management strategy (TQM) tend to emphasize non-traditional performance measures such as product failure rates, late delivery rates and order lead times.

Several researchers have examined the performance implications of aligning control systems (including performance measurement) with strategy. No consistent results have emerged in this research, possibly due to high variation in both the measures employed and the relationships examined. Sim and Killough (1998) report survey findings showing alignment of strategy with control systems leads to higher customer satisfaction and quality performance. Their measures of customer satisfaction and quality performance are both based on managers' perceptions. Chenhall (1997) shows alignment of performance measurement with a TQM strategy results in better financial performance. The financial performance measure they employ is based on the perception of managers and CEO's. Ittner and Larcker (1997), using survey data from a variety of industries and countries, find no consistent association between alignment of control system practices and objective measures of financial performance (e.g. return on assets, return on sales, sales growth).

Finally, a few studies have examined the relation between non-financial performance indicators such as customer satisfaction and financial outcomes. Ittner and Larcker (1998b) report customer satisfaction and revenue growth are significantly associated for a sample of telecommunications firms. Banker, Potter and Srinivassan (2000) find measures of customer satisfaction are positively associated with future accounting profits and revenues in the hospitality industry.

2.2.4 Analytical Research

Analytical research has not specifically addressed the implications of using a SPMS but settings where multiple performance measures are used have been considered. Feltham and Xie (1994) demonstrate that using more than one performance measure has value because it can reduce the risk imposed on a manager and it induces managerial behavior more congruent with firm-level payoffs.[4] This latter result is consistent with the coordination role of a SPMS identified by Atkinson et al. (1997).

Analytical studies have also examined the weighting of multiple performance measures in incentive contracts. The models demonstrate that the relative weights should be inversely proportional to the noisiness of the performance measure, the noisier the measure the smaller the weight (e.g. Banker and Datar 1989). The practical implication of the Banker and Datar (1989) model in a SPMS setting is that greater weight should be placed on performance measures that are more sensitive to managers' efforts.

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[4] For the additional performance measures to be of value the model requires them to: (1) be correlated (less than 1) with the original measure; and (2) possess a degree of precision (i.e. not completely influenced by uncontrollable events).

2.2.5 Conclusions

The research reviewed in this Chapter leads to several conclusions. First, strategy affects the content of an organization's performance measurement system. Second, the SPMS appears to fulfill a coordination role by clarifying strategy and identifying factors affecting an organization's success (although this evidence is mostly anecdotal). Third, the usefulness of a SPMS as monitoring tool may be impaired by a tendency to focus on common measures when comparing results across different business units. Finally, empirical evidence indicates cause-effect relationships may exist between certain non-financial measures, such as customer satisfaction and future financial performance.

The review also highlights that extant research has just begun to examine the behavioral implications of using a SPMS. While proponents claim the approach leads to clarification of strategy, more focused effort and greater commitment, little is understood about the mechanisms by which these benefits might materialize. If a SPMS is to drive performance gains, the literature review and field interviews reinforce the importance of managers being committed to achieving the multiple, causally-linked performance goals contained in a SPMS. The next chapter presents theory and evidence about the factors affecting goal commitment decisions.

CHAPTER 3

A THEORETICAL FRAMEWORK FOR GOAL COMMITMENT DECISONS

3.1 A Goal Theory Background

Evidence presented in Chapter 2 indicates organizations often set challenging goals for the multiple performance measures contained in a SPMS. Research over the past 30 years shows difficult goals are significantly more likely to have performance benefits if individuals are committed to achieving them (Klein et al. 1999). This chapter presents a theoretical framework of the factors affecting goal commitment decisions. Because research shows participation in goal setting can increase commitment, the focus in developing the framework will be on assigned goals. Using an assigned goal setting with no participation will provide a more stringent test of the predictions developed in Chapter 4.

The starting point is Locke's (1968) goal theory framework. Goal theory establishes a framework of the factors affecting goal commitment and is applicable to this study for two reasons. First, a key feature of a SPMS expected to affect goal-setting behavior is its causal-linkage content. This information focus is consistent with a central element of goal theory: the nature and availability of task relevant information affects goal setting behavior. Numerous studies have shown that information leading to a better understanding of the task environment can increase commitment to performance goals (e.g. Earley 1985, 1986; Kren 1992; Tziner and Kopelman 1988). The second reason for adopting goal theory is its predictive validity in applied settings. Goal theory predictions have been supported in a variety of organizational settings involving numerous tasks (see Locke and Latham 1990 for a review). Similar support for goal theory is also found in the

accounting literature in complex organizational settings (e.g. Chong and Chong 1999; Hirst and Lowy 1990; Hirst and Yetton 1999; Kren 1990).

3.2 The Role of Goal Commitment and Personal Goals

3.2.1 Measures of intention to achieve a goal

One of the most robust findings of goal theory is that specific, difficult goals can lead to higher performance (Mento, Steel and Karren 1987). The mechanisms by which goals affect performance are effort, attention, persistence and task strategy formulation. Research shows a positive association between goal difficulty and each of these mechanisms, which in turn can affect performance (see Locke and Latham 1990 for a review).[5] The goal difficulty-performance relationship has been supported by numerous psychology studies (e.g. Earley and Perry 1987; Smith, Locke and Barry 1990) and by accounting research (e.g. Hirst and Lowy 1990; Waller and Chow 1985).[6] Given these findings, it is not surprising that the use of specific, difficult goals for both financial and non-financial measures is a common feature of a SPMS (Chow, Cooper and Haddad 1997; Otley 1999).

Evidence indicates difficult assigned goals are more likely to lead to higher performance if individuals intend to achieve those goals (Figure 1). A meta-analysis conducted by Klein et al. (1999) shows goal commitment moderates the goal difficulty – performance relationship across a variety of lab and field settings. Goal commitment is defined as "the determination to try for a goal and the persistence in pursuing it over

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[5] Locke and Latham (1990) note that in complex environments, task strategy is relatively more important than effort, attention and persistence in mediating the effects of goal difficulty on performance.

[6] Conflicting findings do exist. For example, based on a survey of 358 automobile design engineers, Shields et al. (2000) find standard tightness (goal difficulty) is positively associated with job-related stress, which in turn is negatively related to performance. However, goal commitment was not measured in the study, which the authors acknowledge can affect the goal-difficulty performance relationship.

time" (Hollenbeck, Williams and Klein 1989b, pg. 18). Goal commitment is normally assessed using a self-report measure of an individual's intention to achieve an assigned goal (e.g. Renn 1998).

Another measure of intention to achieve an assigned goal is self-set or personal goals. Personal goals represent the level of performance individuals decide they will attempt to achieve (Locke and Latham 1990; Tubbs 1994). Wright, O'Leary-Kelly, Cortina, Klein and Hollenbeck (1994) suggest personal goals are important to consider in assigned goal settings because they reflect a more precise measure of intention. While self-reported goal commitment captures intentions at a general level, personal goals are a specific indication of intended performance. To more fully assess intentions in assigned goal settings, researchers have often asked participants to set personal goals, in addition to gathering the self-report commitment measure (e.g. Earley 1986; Wright et al. 1994).

3.2.2. Performance consequences of goal commitment and personal goals

Although this study focuses on SPMS features likely to affect goal commitment and personal goals it is worthwhile to briefly review empirical evidence that: (1) establishes the importance of goal commitment in the relation between difficult goals and performance; and (2) shows the positive association between personal goals and performance.

In a recent meta-analysis of 66 studies, Klein et al. (1999) find a significant positive correlation between goal commitment and performance. Klein et al. (1999) also report that goal commitment significantly moderates the relationship between goal difficulty and performance; difficult goals have a greater impact on performance when commitment to those goals is high. Consistent with the results of the meta-analysis,

Wright et al. (1994) find goal commitment moderates the relation between goal difficulty and performance in a simple task using student participants. Employing a simple task with experienced technicians and engineers, Erez and Zidon (1984) report commitment moderates the goal difficulty-performance relationship. Other studies have examined the main effects of goal commitment on performance when only difficult goals are assigned. Klein and Kim (1998) find a high correlation between goal commitment and sales performance for a sample of 105 salespersons. In a survey of experienced managers Renn (1998) reports a significant association between commitment to negotiated goals and performance. Using a business simulation, Kren (1990) finds a significant correlation between goal commitment (assigned and participatively set goals) and performance.

The impact of personal goals on performance is also well documented. Brown et al. (1998) find the difficulty of personal goals and sales performance are highly correlated for a sample of experienced salespersons. Similarly, Earley (1986) finds a strong association between personal goal difficulty and performance for a sample of production-line employees. Participants who set the most difficult personal goals in Cervone, Jiwani and Wood's (1991) business simulation study achieved the highest performance.

Collectively these studies highlight the importance of goal intentions to the goal theory framework in simple as well as complex organizational settings. Individuals' willingness to commit to difficult assigned goals and set difficult personal goals can positively influence performance. Therefore, understanding the factors affecting goal commitment and personal goals is vital in settings such as a SPMS where multiple difficult performance goals are used.

3.2.3. Antecedents of goal commitment and personal goal decisions

Figure 2 identifies three antecedents of goal commitment and personal goal decisions (Hollenbeck and Klein 1987; Locke, Latham and Erez 1988). The first factor is self-efficacy (Bandura 1997). Self-efficacy represents "beliefs in one's capabilities to mobilize the motivation, cognitive resources and course of actions needed to meet given situational demands (Wood and Bandura 1989, pg. 408). Self-efficacy is an assessment of what one is capable of doing in a variety of task circumstances given existing skills and abilities; it is *not* a simple assessment of one's inventory of skills and abilities (Bandura 1997).

Bandura's (1977, 1982) theory of self-efficacy originated with research on phobias and other behavioral disorders. As an example of the early research, Bandura (1982) reports that enhancing phobics' self-efficacy for coping with highly threatening tasks (e.g. staying in the same room as a snake) leads to lower fear arousal and improvements in task performance. Although no known accounting studies have utilized self-efficacy theory, it has been extensively applied in psychology and organizational behavior research. Positive associations have been documented between self-efficacy and a variety of work-related behaviors including managerial idea generation, performance of joint venture managers, skill acquisition, newcomer adjustment, corporate compliance with the law and adaptability to advanced technology (Geringer and Frayne, 1993; Jenkins 1994; Stajkovic and Luthans 1998).

Some researchers have integrated expectancy and goal theories with "expectancy" identified as an antecedent of goal commitment and personal goal difficulty in place of self-efficacy (Hollenbeck and Klein 1987; Klein et al. 1999). "Expectancy" is a belief

that a given level of effort will lead to a certain performance level (Chowdhury 1993) and research shows expectancy is positively associated with both goal commitment and personal goal difficulty (Klein 1991; Kren 1990). Self-efficacy is adopted in this study because it represents a broader construct than expectancy; self-efficacy involves an assessment of factors other than effort, such as the abilities to cope with pressure, sustain motivation, and develop task strategies (Gist 1987; Wright and Kacmar 1995).

Two aspects of self-efficacy are important to emphasize. First, research shows self-efficacy is not a personality trait but instead can be influenced by a number of factors including past performance, modeling, persuasion, task-relevant information, and the task environment (Bandura 1997; Bandura and Wood 1989; Gist, 1989; Whyte, Saks and Hooks 1997).[7] Second, self-efficacy is not the same as self-esteem; self-esteem relates to judgments about self-worth while self-efficacy is an assessment of one's ability to meet task-specific demands (Bandura 1997). Although the two concepts may be correlated, they need not be; an individual may feel highly efficacious for an activity from which they derive little self-worth (e.g. foreclosing on mortgages) (Gardner and Pierce 1998).

Research has consistently shown that self-efficacy significantly influences goal commitment and personal goal decisions in both simple and complex settings. For example, employing a task where students list uses for common objects, Locke, Frederick, Lee and Bobko (1984) find self-efficacy has a positive impact on both goal commitment and the difficulty of personal goals. Also using a simple task and student participants, Button, Mathieu and Aikin (1996) find self-efficacy has a significant impact on personal goals. In a more complex production-line setting, Earley (1986) reports that

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[7] Although not the focus of this study, several individual factors have been found to affect self-efficacy including locus of control, achievement motivation and goal orientation (Mathieu, Martineau and Tannebaum 1993; Phillips and Gully 1997).

commitment to difficult performance goals is positively associated with self-efficacy beliefs. Brown et al. (1998) find self-efficacy beliefs have a positive influence on the difficulty of salespersons' personal sales goals at a medical supplies distributor. Finally, using a business simulation task, both Bandura and Jourden (1991) and Wood, Atkins and Bright (1999) show that participants with the highest self-efficacy set the most difficult personal goals.

The second antecedent of goal commitment and personal goal decisions is the attractiveness of goal attainment (Figure 2). Goal attractiveness is defined as "the anticipated satisfaction from goal attainment" (Klein 1991, pg. 238). Klein (1991) suggests goal attractiveness subsumes intrinsic and extrinsic valences of goal accomplishment as well as instrumentality beliefs (performance levels lead to certain outcomes). Although some researchers have separately measured each of these components (e.g. Brownell and McInnes 1986) recent studies have commonly used the single-construct "goal attractiveness" (e.g. Hollenbeck et al. 1989b; Klein and Wright 1994; Kren 1990; Wright 1992).[8]

Figure 2 shows that goal attractiveness is influenced by a number of factors including need for achievement, personality type, rewards, competition and organizational commitment (Hollenbeck and Klein 1987). Research has tended to focus on the links between rewards, goal attractiveness and goal commitment. Studies employing simple tasks and student participants show that providing incentives increases goal attractiveness, which in turn increases goal commitment (Wright 1992; Klein and Wright 1994). Similarly, in an experimental setting using a clerical task, Riedel, Nebeker

[8] Some researchers have used the single construct "valence" in place of "attractiveness"(e.g. Kren 1990; Wright 1992). However the operationalization and measurement of valence in these studies is similar to the approach used by Klein (1991) for goal attractiveness.

and Cooper (1988) report higher goal commitment and more difficult personal goals when incentives exist for goal attainment. Using a business simulation and undergraduate students, Kren (1990) finds incentives increase goal attractiveness, which positively impacts goal commitment. Evidence also shows the type of incentive plan can affect goal commitment and personal goals. Two experimental studies employing simple tasks show piece-rate incentive plans lead to more difficult personal goals than bonus-for-goal attainment plans (Lee, Locke and Phan 1997; Wright 1992). This evidence is consistent with accounting research that finds bonus-for-goal attainment plans result in budgets intentionally set below expected levels of performance (e.g. Chow, Cooper and Haddad 1991; Lowe and Shaw 1968; Merchant and Manzoni 1989).

The third antecedent of goal commitment and personal goal decisions is ability. Hollenbeck et al. (1989b) and Klein and Wright (1994) report significant associations between task-related ability and goal commitment in non-business experimental settings (GPA and anagram solving task goals respectively). Using a complex business simulation task, Bandura and Wood (1989) find participants with higher task ability set more difficult personal goals.

Hollenbeck and Klein (1987) suggest the effects of task ability on goal commitment and personal goals are mediated by self-efficacy (expectancy). However, several studies show ability and self-efficacy (expectancy) both have significant direct effects on goal commitment (e.g. Klein 1991; Klein and Wright 1994) and personal goal decisions (e.g. Earley and Lituchy 1991; Thomas and Mathieu 1994). Accordingly the framework adopted in this study treats ability and self-efficacy as separate antecedents of goal commitment and personal goal difficulty.

3.3 Summary

The research reviewed in this Chapter shows goal commitment is a critical element in the goal theory framework: goal commitment significantly moderates the goal difficulty – performance relationship. The literature review also reveals goal commitment antecedents fall into three categories: self-efficacy; goal attractiveness; and ability. In the next chapter the basic goal commitment framework is applied to the SPMS setting. Specifically, predictions are developed about the impact of the two key SPMS features identified in Chapter 2 on goal commitment and its antecedents.

CHAPTER 4

HYPOTHESES DEVELOPMENT

4.1 Hypotheses Overview

Evidence presented in Chapter 2 indicates difficult goals are commonly established for the financial and non-financial SPMS measures. This is not surprising since many companies adopt a SPMS to drive financial performance improvements (Ford 2000; Olve et al. 2000) and research shows goal difficulty and performance are positively associated (Locke and Latham 1990). However, the literature reviewed in Chapter 3 demonstrates difficult goals are significantly more likely to improve performance when managers are committed to achieving them (Figure 1). Therefore identifying the determinants of goal commitment is critical in settings where difficult goals are employed. Understanding the factors affecting goal commitment in the SPMS hierarchical goal structure is particularly important since managers will often be responsible for achieving difficult non-financial *and* financial goals. A lack of managerial commitment to either the financial or non-financial SPMS goals may limit the potential for a SPMS to positively impact performance. Given the common use of difficult goals in a SPMS, commitment to both financial and non-financial goals are the key dependent variables examined in this study (right-hand portion of Figure 3).

The left-hand portion of Figure 3 shows the two SPMS features identified in Chapter 2 predicted to affect goal commitment decisions. The first feature is the content of the SPMS: the strength of the cause-effect linkages among non-financial and financial objectives and performance measures. Chapter 2 identified the cause-effect "web of logic" (Atkinson and Epstein 2000, pg. 28) as a defining feature of a SPMS, setting it

apart from other 'multiple objective' systems (e.g. management by objectives) that lack a cohesive framework (Ford 2000). The SPMS causal-linkages are a critical feature of the approach. They represent management's theory about the drivers of financial performance in the organization. If well developed, they have the potential to provide managers with a clear focus on what needs to be done to accomplish goals and objectives (Atkinson and Epstein 2000; Kaplan and Norton 1996). Based on the goal-theory framework presented in Chapter 3, the strength of SPMS causal-linkages is expected to have a direct impact on managers' willingness to commit to financial and non-financial performance goals.

The second feature of a SPMS predicted to affect goal commitment is its hierarchical goal structure. In a goal hierarchy secondary goals are established as a means of achieving primary goals (Austin and Vancouver 1996; Klein 1989; Lord and Hanges 1987). In a SPMS, non-financial (secondary) goals represent the means of achieving financial (primary) goals (Atkinson et al. 1997). Therefore, managers' beliefs in the achievability of SPMS non-financial goals are crucial given their causal-linkage to the financial goals (Figure 3). These beliefs may be affected by a variety of factors including resource availability, time constraints and controllability issues. Managers' beliefs in the achievability of SPMS non-financial goals are predicted to affect both financial and non-financial goal commitment.

Research shows allowing managers to participate in setting their own goals can foster goal commitment (Renn 1998). However, this study uses an assigned goal setting (no participation) to test the impact of key SPMS features on goal commitment. The

assigned goal approach provides a more stringent test of theory since lower levels of commitment can be expected in the absence of participation.

As discussed in Chapter 3, two different measures are often used to assess intention to achieve an assigned goal: (1) a self-report measure representing a general reaction to the goal; and (2) a specific goal representing the level of performance the individual would attempt to attain if free to choose ("personal goal"). Both measures will be used to assess commitment to financial goals and the first measure will be used to assess commitment to non-financial goals. The decision not to use the "personal goal" measure for non-financial goals is a function of the SPMS features examined in this study. Investigating the effects of SPMS causal-linkages on goal commitment will require manipulation of the strength of those linkages. The first measure provides a useful assessment of managers' general willingness to commit to non-financial goals under conditions of weak or strong causal-linkages. However the value of asking managers to develop specific non-financial goals when SPMS causal-linkages are weak is limited. Few insights into goal setting behavior would be gained by requiring participants to set specific goals for non-financial measures weakly linked to financial performance.[9]

The specific hypotheses developed in this study are summarized in Figure 4 with the heavy bold lines representing the key contributions. The key hypotheses illustrate: (1) the effects of the two SPMS features on both financial and non-financial goal commitment; and (2) the nature of the association between financial and non-financial goal commitment. The development of the hypotheses in the sections below will proceed

[9] An additional concern is that use of the "personal goal" measure for non-financial goals may place excessive cognitive demands on participants. Requiring managers to formulate personal goals for non-financial measures weakly linked to financial performance could be considerably more effortful than responding to the first measure. The benefits of collecting the additional measure do not appear to justify the additional demands placed on participants.

as follows. First, separate predictions are developed for the effects of the two SPMS features on financial and non-financial goal commitment. Next, hypotheses are established for the expected association between financial and non-financial goal commitment. Then, hypotheses are developed for the two variables (self efficacy and goal attractiveness) expected to mediate the effects of causal-linkage strength and non-financial goal achievability on goal commitment. Finally, possible interactive effects of the strength of SPMS cause-effect linkages and beliefs about the achievability of non-financial goals are explored. Because the theoretical basis for predicting interactive effects is not strong, they are presented as research questions.

4.2 Strength of the SPMS Causal-Linkages

As discussed above, the content of a SPMS represents a critical feature of the approach. The causal-linkages among SPMS non-financial and financial objectives, measures and goals articulate management's theory about the drivers of performance in the organization. The hypotheses developed in this section (Figure 4, H1 and H2) predict the strength of the causal-linkages will affect commitment to both financial and non-financial goals.

4.2.1 Financial Goal Hypotheses

Two key findings from the goal setting literature presented in Chapter 3 are: (1) increases in self-efficacy can lead to higher goal commitment; and (2) self-efficacy can be increased by information that provides an improved understanding of the factors

affecting task performance.[10] This type of information is consistent with the definition of job relevant information (JRI) found in the accounting literature: "information that provides the manager with a better understanding of the decision alternatives and actions needed to reach objectives" (Kren 1992, pg. 512).

Findings from the field interviews and literature review presented in Chapter 2 indicate the information contained in a SPMS is consistent with JRI as defined above; the non-financial objectives and performance measures represent the means by which financial performance goals can be achieved. Anecdotal evidence from case studies supports the observation that SPMS causal-linkages represent JRI. Rucci et al. (1998) report the SPMS model developed by Sears provided managers with a better understanding of the non-financial factors leading to revenue growth. Similarly, many of the field interviewees indicated their SPMS has resulted in an improved understanding of the factors that drive financial performance in their organizations.

Although previous research has not considered the impact of SPMS causal-linkage strength on managerial behavior, several studies have examined the effects of JRI provided by other means. For example, Gist (1989) reports training in problem solving techniques increases managers self-efficacy for idea generation. In a field study of entry-level accountants in a public accounting firm, Saks (1995) finds the amount of task specific training is positively associated with efficacy assessments. Research has also examined the direct link between JRI and goal commitment. In a study of middle level managers at manufacturing facilities, Chong and Chong (1999) report a significant association between JRI generated through budgetary participation and goal commitment.

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[10] The two measures of goal commitment discussed in Section 4.1 are similarly influenced by self-efficacy and goal attractiveness (Figure 2). To simplify the discussion "goal commitment" refers to both measures. However, for financial goal commitment predictions, separate hypotheses are stated for each measure.

Similarly, Tziner and Kopelman (1988) find managers are more committed to goals when provided with information about how to achieve them during their performance appraisal.

Based on the foregoing, the strength of the causal-linkages (JRI) articulated in the SPMS is predicted to affect managers' commitment to difficult financial goals. The mechanism responsible for this relationship is managers' beliefs in the achievability of the financial goal: "financial goal self-efficacy." The evidence presented in Chapter 3 demonstrates self-efficacy beliefs are a direct antecedent of goal commitment decisions. In a SPMS, the stronger the causal link between the non-financial and financial objectives and performance measures, the higher managers' financial goal self-efficacy. Self-efficacy is strengthened because the causal-linkages provide information about the non-financial factors leading to the achievement of the financial goals. Although the causal-linkages do not identify the specific actions required to achieve the financial goals, they establish a framework that identifies where effort and attention must be focused. By affecting self-efficacy, the strength of SPMS causal-linkages will positively influence commitment to difficult assigned financial goals (Figure 4, H1a-b).[11] The specific hypotheses are:

H1a: Managers' commitment to difficult financial performance goals will be higher when a SPMS contains strong rather than weak causal-linkages (JRI).

H1b: Managers will set more difficult personal goals for financial performance when a SPMS contains strong rather than weak causal-linkages (JRI).

[11] The degree to which SPMS causal-linkage strength (JRI) impacts self-efficacy will be assessed through manipulation checks (discussed in Chapter 5). The mediating role of self-efficacy reflected in Figure 4 is examined in H6a-b.

4.2.2 Non-Financial Goal Hypothesis

The strength of the causal-linkages (JRI) is also expected to affect commitment to difficult SPMS non-financial goals. Evidence presented in Chapter 3 shows goal attractiveness is an antecedent of goal commitment. In a hierarchical goal setting such as a SPMS, secondary goals will be more attractive if they lead to achievement of primary goals. Consistent with the propositions developed by Klein (1989), if achieving the SPMS financial goal (primary goal) is attractive to managers they will be more committed to non-financial goals (secondary goals) they believe are causally-linked to the financial goal.

The foregoing assumes achieving the SPMS financial goal is attractive. A common approach organizations use to make SPMS financial goals attractive is to provide financial incentives for achieving them (Ittner et al. 1997; Waterhouse and Svendsen 1998). Managers may also be rewarded directly for achieving non-financial goals (Kaplan and Norton 1996) and evidence reviewed in Chapter 3 demonstrates this can lead to higher goal commitment. However, this study predicts the strength of the SPMS causal-linkage content will affect commitment to non-financial goals even though those goals may not be directly rewarded by the incentive system. This prediction represents a substantive contribution to understanding goal commitment decisions in a SPMS setting since no studies have examined how the attractiveness of a primary goal (financial) can affect commitment to a causally related secondary (non-financial) goal.

The key to this prediction is the strength of the causal-linkages identified in the SPMS; the stronger the causal links (JRI) between SPMS non-financial and financial objectives and performance measures, the more attractive the non-financial goals will be.

By influencing the attractiveness of non-financial goal attainment, the strength of SPMS causal-linkages (JRI) will positively impact commitment to difficult SPMS non-financial goals (Figure 4, H2).[12] Assuming the financial goal is attractive, the specific hypothesis is:

> **H2:** Managers' commitment to difficult non-financial performance goals will be higher when a SPMS contains strong rather than weak causal-linkages (JRI).

4.3 Beliefs in the Achievability of SPMS Non-Financial Goals

The second SPMS feature predicted to affect commitment to financial and non-financial goals is managers' beliefs about the achievability of the non-financial goals. These beliefs represent a manager's self-efficacy assessment for non-financial goal achievement.[13] In the hierarchical SPMS goal structure, managers' beliefs about the achievability of non-financial goals are of central importance since those goals represent the drivers of financial performance. The hypotheses developed below predict beliefs about the achievability of SPMS non-financial goals will impact both financial and non-financial goal commitment (Figure 4, H3 and H4).

4.3.1 Financial Goal Hypotheses

Research reviewed in Chapter 3 shows self-efficacy beliefs have a significant influence on goal commitment decisions. The stronger the beliefs in the achievability of a

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[12] The degree to which SPMS causal-linkage strength affects non-financial goal attractiveness will be assessed through manipulation checks (discussed in Chapter 5). The mediating role of goal attractiveness is examined in H6c.

[13] The goal setting literature makes a distinction between beliefs about the achievability of a goal and the difficulty of that goal. In settings where goals are assigned, goal difficulty is objectively determined, often by means such as benchmarking or task analysis. The focus is then on the relationship between individuals' beliefs in their ability to achieve the 'difficult' goal and their willingness to commit to that goal (e.g. Earley 1986).

goal, the stronger the commitment to that goal (Bandura 1997). However, research has *not* examined how efficacy beliefs for one set of goals can impact commitment decisions for causally related goals. In hierarchical goal settings such as a SPMS, non-financial goals (secondary) represent the means of achieving the financial goals (primary). Therefore, in a SPMS setting, beliefs about the achievability of non-financial goals will influence beliefs about the achievability of the financial goals. For example, if managers have doubts about the achievability of the non-financial goals due to resource constraints, time pressures or other factors, they are likely to have concerns about their ability to attain the causally related financial goals. By influencing managers' self-efficacy for financial goal achievement, beliefs about non-financial goal achievability will affect commitment to difficult assigned financial goals.[14] The specific hypotheses are: (Figure 4, H3):

H3a: Managers who believe SPMS non-financial goals can be achieved will be more committed to difficult financial goals than managers who believe there is a lower likelihood of achieving the non-financial goals.

H3b: Managers who believe SPMS non-financial goals can be achieved will set more difficult personal goals for financial performance than managers who believe there is a lower likelihood of achieving the non-financial goals.

4.3.2 Non-Financial Goal Hypothesis

As noted above, beliefs about non-financial goal achievability represent a self-efficacy assessment and research shows efficacy beliefs are positively associated with

[14] The degree to which the beliefs about non-financial goal achievability affect financial goal self-efficacy will be assessed through manipulation checks (discussed in Chapter 5). The mediating role of financial goal self-efficacy is examined in H6.

goal commitment (e.g. Brown et al. 1998).[15] Accordingly, the specific hypothesis is (Figure 4, H4):

> **H4**: Managers who believe SPMS non-financial goals can be achieved will be more committed to difficult non-financial goals than managers who believe there is a lower likelihood of achieving the non-financial goals.

4.4 Association Between SPMS Financial and Non-Financial Goal Commitment

The SPMS structure is based on a cause-effect model of performance: achieving non-financial goals will eventually contribute to achievement of financial goals. However, the relationships summarized in Figure 4 do not suggest the same cause-effect model of goal commitment. Commitment to non-financial goals is not predicted to be an antecedent of financial goal commitment. Instead, the strength of SPMS causal-linkages and beliefs about non-financial goal achievability are predicted to influence commitment to *both* financial and non-financial goals through separate mechanisms. The strength of SPMS causal linkages and beliefs about the achievability of non-financial goals both impact commitment to financial goals through their impact on financial goal self-efficacy. The strength of causal-linkages affects non-financial goal commitment through non-financial goal attractiveness and a direct relationship exists between beliefs about non-financial goal achievability and commitment to non-financial goals.

The model presented in Figure 4 predicts a positive association will exist between commitment to financial and non-financial goals. The implication of this association is that actions taken by management to strengthen the SPMS causal-linkages or to raise beliefs about the achievability of non-financial goals will have beneficial

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[15] Because beliefs about the achievability of SPMS non-financial goals represent an efficacy assessment, only the direct link represented by H4 exists in Figure 4. There is no mediating variable between non-financial goal self-efficacy and non-financial goal commitment.

effects on both financial and non-financial goal commitment. The specific hypotheses are as follows (Figure 4, H5):

H5a: There will be a positive association between managers' commitment to SPMS financial and non-financial goals.

H5b: There will be a positive association between the difficulty of managers' personal goals for financial measures and their commitment to SPMS non-financial goals.

4.5 Mediation Hypotheses

In the goal commitment framework summarized in Figure 2, self-efficacy and goal attractiveness mediate the effects of numerous variables on goal commitment including job relevant information and rewards (Hollenbeck and Klein 1987). Based on that framework, financial goal self-efficacy and non-financial goal attractiveness are predicted to mediate the effects of SPMS causal-linkage strength and beliefs about non-financial goal achievability on goal commitment (Figure 4, H6 and H7). The mediation predictions developed below provide a richer understanding of the means by which the SPMS features affect financial and non-financial goal commitment. The predictions are also of interest because they highlight self-efficacy and goal attractiveness as direct antecedents of SPMS goal commitment. Any steps management can take to improve beliefs in the achievability or attractiveness of goal will have favourable consequences for goal commitment.

4.5.1 Mediation of the SPMS Causal-Linkage Effects

Consistent with the discussion supporting H1, financial goal self-efficacy is predicted to mediate the effects of SPMS causal-linkage strength on financial goal

commitment and personal goals.[16] Causal-linkage strength is expected to positively impact financial goal self-efficacy, which in turn will positively affect financial goal commitment and personal goals. The specific hypotheses are (Figure 4, H6a-b):

H6a: Financial goal self-efficacy will mediate the effects of SPMS causal-linkage strength on managers' commitment to difficult financial goals.

H6b: Financial goal self-efficacy will mediate the effects of SPMS causal-linkage strength on the difficulty of managers' personal goals for financial measures.

Based on the discussion supporting H2, non-financial goal attractiveness is predicted to mediate the effects of SPMS causal-linkage strength on commitment to non-financial goals. The strength of SPMS causal-linkages will positively influence non-financial goal attractiveness, which in turn will positively impact commitment to non-financial goals. The specific hypothesis is (Figure 4, H6c):

H6c: Non-financial goal attractiveness will mediate the effects of SPMS causal-linkage strength on managers' commitment to difficult non-financial goals.

4.5.2 Mediation of the Non-Financial Goal Achievability Effects

Hypotheses 3 predicts non-financial goal achievability will influence financial goal commitment and personal goals through its impact on financial goal self-efficacy. Non-financial goal achievability will positively affect financial goal self-efficacy, which will have a positive influence on financial goal commitment (personal goals). The specific hypotheses are (Figure 4, H7a-b):

H7a: Financial goal self-efficacy will mediate the effects of non-financial goal achievability on managers' commitment to difficult financial goals.

[16] Baron and Kenny's (1986) three-step regression approach will be used to test each mediation hypotheses.

H7b: Financial goal self-efficacy will mediate the effects of non-financial goal achievability on the difficulty of managers' personal goals for financial measures.

4.6 Research Questions: Interaction Effects

4.6.1 Financial Goal Commitment

The strength of SPMS causal-linkages and beliefs about non-financial goal achievability may also have an interactive effect on commitment to difficult SPMS financial performance goals (Figure 5, Panel A). The basis for the interaction is the hierarchical goal structure of a SPMS. Beliefs about the achievability of non-financial goals are more likely to influence self-efficacy beliefs about financial goals when strong cause-effect relationships exist in the SPMS. Specifically, when strong causal-linkages exist, beliefs about the achievability of the non-financial goals may have a strong impact on efficacy assessments for financial goal achievement. Conversely, when the causal-linkages are weak, beliefs about the achievability of the non-financial goals may have a weaker impact on efficacy assessments for financial goal achievement. Accordingly, the stronger the SPMS causal-linkages, the greater the impact achievability of non-financial goals will have on managers' commitment to difficult financial performance goals. Assuming organizations strive to develop a SPMS that contains strong causal-linkages, the nature of this interaction highlights the importance of establishing non-financial goals managers believe they can achieve.

Alternatively it is plausible to expect causal-linkage strength and beliefs about non-financial goal achievability to have additive instead of interactive effects. As long as there are some causal-linkages among the objectives and performance measures contained in the SPMS, beliefs about the achievability of the non-financial goals may

have a similar effect on goal commitment regardless of the strength of the causal-linkages. Only if the SPMS non-financial objectives and measures have no causal relation to financial outcomes, might the potential for interactive effects exist.

This is the first study to examine the combined effects of SPMS causal-linkage strength and beliefs about non-financial goal achievability and theory does not strongly support either possibility. Therefore the following research questions are posed:

RQ1a: Will SPMS causal-linkage strength and beliefs about non-financial goal achievability interact in their effect on managers' commitment to difficult financial goals?

RQ1b: Will SPMS causal-linkage strength and beliefs about non-financial goal achievability interact in their effect on the difficulty of managers' personal goals for financial performance?

4.6.2 SPMS Non-Financial Goals

The strength of SPMS causal-linkages and beliefs about non-financial goal achievability may also have an interactive effect on commitment to SPMS non-financial goals (Figure 5, Panel B). The nature of the interaction is again driven by the hierarchical goal structure of a SPMS. Consistent with the discussion supporting H2, when SPMS causal-linkages are weak, the attractiveness of the non-financial goals is likely to be low. When goal attractiveness is low, beliefs about the achievability of the non-financial goal may have a relatively weak impact since the potential for goal commitment is limited (Figure 5, Panel B, dashed line). However, when the SPMS causal-linkages are strong, the attractiveness of attaining the non-financial goals is higher. When non-financial goal attractiveness is high, the achievability of those goals may have a stronger effect goal commitment (Figure 5, Panel B, solid line). Assuming organizations attempt to establish a SPMS with strong causal-linkages, the form of this interaction again highlights the

fundamental importance of establishing non-financial goals managers believe they can achieve.

It is also possible that the effects of SPMS causal-linkage strength and beliefs about non-financial goal achievability may be additive instead of interactive. As long as there is some causal-linkage between the non-financial and financial objectives and measures in the SPMS, the effects of non-financial goal achievability on commitment may be similar across differing strengths of the causal-links. Again neither alternative is clearly supported by theory so the following research question is posed:

RQ2: Will SPMS causal-linkage strength and beliefs about non-financial goal achievability interact in their effects on managers' commitment to difficult non-financial goals?

Chapter 5

RESEARCH DESIGN

5.1 Design Overview

An experiment, administered in the field with experienced managers as participants, is used to test the hypotheses developed in Chapter 4. The experimental approach offers the advantage of being able to observe the effects of SPMS information content and non-financial goal achievability in a controlled setting. For this study, control is a particularly important benefit of the experimental method for two reasons. First, several individual-level variables (e.g. personality type) identified in Chapter 3 are known to affect goal commitment and personal goals through self-efficacy and goal attractiveness (see Figure 2). The potential impact of these variables is controlled by random assignment to treatments. Second, several situational factors (e.g. reward system type) are also known to affect goal commitment and personal goals (see Figure 2). Other factors such as the organization's level of profitability, experience with innovation and change, and strategic focus have not yet been examined in goal-setting research but could also potentially affect goal commitment and personal goals decisions. The experimental approach permits control of situational variables that may affect goal commitment and personal goal decisions.

The experimental design is summarized in Figure 6. Goal commitment and personal goals are the dependent variables. The two independent variables are the strength of the SPMS causal-linkages and non-financial goal achievability. Each independent variable is manipulated at two levels. The strength of SPMS causal-linkages is manipulated within subjects (Ss) (Figure 6, Cases 1 and 2). An advantage of using a

within Ss manipulation is that it controls for different experiences and backgrounds that may influence reactions to the experiment materials (Luft and Libby 1997). Having participants respond to different SPMS scenarios in an experimental setting is not inconsistent with the realities of the workplace. Given the common use of cross-functional teams and workgroups in organizations (Drake, Haka and Ravenscroft 2000), managers may be involved in numerous projects at any particular time, each requiring achievement of performance targets. Non-financial goal achievability is manipulated between Ss (Figure 6, Groups A and B). Implementing the experiment using an entirely within Ss approach was impractical due to the time required to complete four cases and the increased risk of demand effects. Non-financial goal achievability is manipulated between Ss because feedback from pre-tests indicated it is more susceptible to demand effects. All experimental materials were administered to participants using either Microsoft Access® or the Internet.[17]

5.2 Case Materials

5.2.1 Details of the Content

All participants worked through two goal-setting cases and responded to a series of questions for each. A copy of the materials is included in Appendix 1. Participants assumed the role of a department head at Eastern Canadian Bank (ECB), a hypothetical company. ECB is described as a federally chartered bank serving Eastern Canada.[18] Background information on ECB and comparative industry statistics (based on actual banking industry results) were provided. To provide a plausible reason for the focus of

[17] The Access and Internet versions were identical in almost every respect and unless otherwise noted, references to experimental "materials" apply to both versions.

[18] ECB is based on the Western Canadian Bank, a federally chartered bank operating in Western Canada. The banking industry was chosen because of the author's practical experience in this setting.

the case on performance measurement, ECB was portrayed as performing well below industry averages. Accounting researchers examining commitment decisions have frequently employed tasks requiring participants to assume a role in a hypothetical setting (e.g. Harrell and Harrison 1994; Harrison, Chow, Wu and Harrell 1999; Whyte, Saks and Hook 1997).

In one case participants were the head of 'Home Banking', a department responsible for developing an online banking system for ECB (Case 2 in Appendix 1). In the other case participants were responsible for a department that develops and maintains websites for ECB's small business clients (Case 1 in Appendix 1). These case settings were chosen because of the topical nature of online commerce. Interviews with pre-test participants showed that even without direct experience in either of these areas, participants were able to relate to the case content. The two cases described the department's operations, history and the strategic goals for the future. The cases were set in the present, about 9 months into fiscal 2000. In each case, strategic revenue growth goals were proposed for fiscal 2002. Pre-test results led to the use of revenue growth strategies to avoid two potential confounds. First, some participants reported certain strategic goals, such as expense reduction, are perceived as inherently less difficult. Second, pre-test participants suggested some managers are generally more committed to expense reduction strategies while others favour revenue growth plans.

Non-financial performance goals were presented for fiscal 2001 in the context of a SPMS. Consistent with the literature review and field interviews, the SPMS contained non-financial objectives, measures and goals, organized by key 'perspectives' in both cases: employees, development, and customers. The same 'perspectives' were used in

each case to avoid the possibility that differences could affect participants' responses. The cases described the fiscal 2001 non-financial objectives, measures and goals as the means by which management believed the 2002 revenue growth goal would be achieved. The different time frame for the non-financial and financial goals was based on the literature review and field interviews, which indicate lags are likely to exist between the two types of performance. For example, achieving customer satisfaction goals may have a financial impact, but not immediately (Ittner and Larcker 1998b). Details of the SPMS were presented sequentially by 'perspective' to allow participants the opportunity to focus on each objective and measure. The SPMS objectives, performance measures, and metrics were defined for participants.

Participants responded to the same set of measures for the dependent variables, manipulation checks and other variables in each case. Each measure is described in subsequent sections. After finishing the first case, participants responded to a series of questions about their background and their company.

5.2.2 Task Involvement

Since participants performed no experimental task (e.g. solving anagrams, building toy castles, etc.) it was essential for them to internalize the information described in the cases. Three design steps were taken to facilitate the internalization process. First, considerable attention was given to developing case scenarios that would be plausible and interesting to participants. The materials drew on the banking industry for actual background information and case details, and much of this information was presented in graphical format. Also, the departments used in each case reflect current trends in the banking industry, and in business generally, to pursue online commerce

opportunities. The products and services depicted in the two cases were based on similar offerings found in actual financial institutions.

Second, the materials were designed so that participants read a section and then responded to the relevant measures before proceeding to the next section. For example, information about the difficulty of the financial goal was presented in the first section of the case with the related measure immediately following. In the next section, SPMS details were presented and participants then responded to questions about its contents. This pattern was repeated throughout the materials.

Third, because participants were required to process a considerable amount of information, they were permitted to review key information before responding to the related measures. For example, when answering questions about the content of the SPMS, participants could return to the SPMS content page(s) and review the details. The navigation features of the materials permitted participants to move back and forth between pages with only two restrictions. First, participants could not return to 'data collection' pages and re-enter responses. Second, except for the general ECB background pages, participants could not return to the first case after commencing the second case.

5.2.3 Pre-Testing

Before finalizing the case materials three separate pre-tests were conducted. Eight individuals with an average of 23 years of managerial experience completed the first pre-test. The materials were administered using PowerPoint® software with participants responding to all measures on pre-printed response pages. Two important findings resulted from this pre-test. First, the use of different strategic goals (revenue versus expense) in the two cases led some participants to ignore the manipulations. Follow-up

interviews revealed some responses were based on a preference for revenue growth versus expense reduction strategies. Second, several participants indicated the process of manually recording and returning their responses was inconvenient. In follow-up interviews participants indicated they believed the materials were clear, understandable, and the case situations engaging.

Based on the results of the first pre-test two major changes were made to the materials. First, each revised case utilized a revenue growth strategy with the same goal of increasing revenues by 75%. Second, the revised materials were delivered electronically instead of manually, using a database software program, Microsoft Access®. The reasons for using the database program are outlined in section 5.7.1 below.[19] The second pre-test was conducted with 7 participants who had an average of 12 years managerial experience. There were four participants in the low achievability condition and three in the moderate (Figure 5). Four of the second-round participants were from a financial institution and two had practical experience with online banking products. Results from the second pre-test showed the non-financial goal achievability manipulation was salient and generally had the expected effects on goal commitment and the difficulty of personal goals. However, the manipulation of causal-linkage strength was not consistently effective across all participants. Follow-up interviews indicated some participants did not perceive noticeable differences in the strength of the SPMS causal-linkages between the two cases. Those participants who *did* find the causal-linkage manipulation salient responded to the goal commitment and personal goal measures as expected. The second group of pre-test participants also found the case

[19] The Internet version was developed after the database version because several organizations that agreed to participate did not have Microsoft Access®.

materials engaging and the measures understandable. The participants from the financial institution offered useful suggestions about ways to improve the SPMS causal-linkage manipulation and the background information. Most of the participants found the database program easy to use and no problems were reported opening, using or returning the file.

The third and final pre-test was conducted with two participants. Two changes were made to the materials based on the results of the second round pre-tests. First, adjustments were made to the 'weak' causal-linkage condition; the SPMS content was changed to further weaken the link between the non-financial and financial objectives and performance measures. Second, details were provided about the competitive environment of each hypothetical department. Two second-round participants suggested this information would help participants make their goal commitment decisions. Follow-up discussions with both final-round participants indicated the changes led to an increase in the salience of the causal-linkage strength manipulation. Based on the findings from the final two rounds of pre-testing, the materials were judged ready to administer.

5.3 Participants

5.3.1 Participant Background

The hypotheses developed in Chapter 4 predict the strength of SPMS causal-linkages and the achievability of non-financial goals will affect goal commitment and personal goal decisions. To provide a meaningful test of the theory, managers with responsibility for achieving performance goals in an organizational setting were identified as suitable participants. Using participants experienced in achieving performance goals allows the theory to be generalized to managers with similar

backgrounds. This is an important benefit since these are the type of individuals typically responsible for achieving SPMS goals and objectives in an organization. Prior experience with a SPMS was determined not to be necessary because it was unclear this would improve the study's generalizability nor was it needed to complete the cases.

The literature review and field interviews were used to further specify the type of participants appropriate for the study. The evidence indicates users of a SPMS will vary with respect to the extent of their managerial experience and their functional area of responsibility. Senior executives may be responsible for achieving SPMS goals and objectives for their business units, as may junior employees at the line level (Epstein and Birchard 1998). Consistent with these observations, the experience requirement used in selecting participants was a minimum of two to three years with no maximum imposed. The minimum level was set to ensure participants had some experience with attempting to achieve performance goals. The SPMS approach may also be applied in various functional areas within an organization (Kaplan and Norton 1996). One of the organizations that participated in the field interviews uses performance measurement scorecards for their business units as well as their support areas, such as administration and accounting. Consequently, no restriction was placed on the functional area from which participants were drawn. Together, these characteristics of the participants' background further enhance the generalizability of the theory developed in Chapter 4.

5.3.2 The Number of Participants

The expected effect size and the desired level of statistical power were used to determine the number of participants required for the study (Cohen 1988). The first step was to calculate actual effect sizes in prior research by reviewing 13 published studies

from the goal setting literature where goal commitment or personal goal difficulty (or both) was the dependent variable and one or more independent variables was manipulated.[20] This approach only permits an approximation of effect sizes since no previous research has examined the combination of independent variables used in this study. Since the objective was to determine an approximate effect size no attempt was made to differentiate the reviewed studies based on the type of participants or task.

The formula used to calculate the effect size (f) is: $d/2\ [(K+1)/3(k-1)]^{1/2}$ where $d = (M_{max} - M_{min})/\sigma$ and k equals the number of groups. Respectively, M_{max} and M_{min} are the largest and smallest mean values for the dependent variable across the experimental conditions and σ represents the common standard deviation within the sample population (Cohen 1988, pg. 276). Cohen (1988) recommends this approach for calculating effect sizes when the k means are approximately evenly spread over the range of experimental conditions. To provide a conservative estimate of d, the largest value of σ for all experimental conditions was used. Where more than one independent variable was examined in a study, separate effect sizes were calculated for each.

Table 2 shows the actual effect sizes for the selected studies where goal commitment and/or personal goals were the dependent variables. The effect sizes for goal commitment range from .03 to .80, with a simple average of .33. Where personal goal difficulty was the dependent variable, the range is 0 to 1.03, with a simple average of .43. Setting α at .05 (probability of Type 1 error) and the desired power level at .80 (probability of rejecting the null hypothesis when false) results in an estimated sample size of about 33 per group based on the average goal commitment effect size, and about

[20] Many studies examined for the Chapter 3 literature review were not be included in the analysis of effect sizes because they did not report means and standard deviations by experimental condition.

23 per group given the average personal goal effect size (Cohen 1988, pg. 384).[21] Given the range of effect sizes and the conservative approach used to calculate them, a sample size of 25 participants per group was chosen. Since two between Ss groups are used in the experimental design (Figure 6), the total number of participants required was estimated to be 50.

5.3.3 Selecting Participants

Using the criteria outlined in section 5.3.1, the next step was to identify participants to take part in the research. Contacts in the business and academic communities were used to select organizations that could potentially provide participants. The nature of the study was explained to each contact, as were the criteria for selecting participants and the nature of the experimental materials. To provide some incentive for participating, each organization was promised a results summary for the experiment and field interviews.

Although this selection approach does not result in a random sample of organizations and participants it is justified for two reasons. First, given the selection criteria it was necessary to have the contacts perform a screening process. This screening would not have been possible in a completely random sample of organizations and participants. Second, because the experiment materials were administered electronically it was necessary to make contact with organizations to explain the procedures for completing the instrument. It is not clear these instructions could have been clearly conveyed using a random selection process.

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[21] Cohen (1988, pg. 56) suggests reasonable levels for power and α in social science research are .80 and .05 respectively. These values imply that Type1 errors are four times as serious as Type II errors (.20/.05).

Based on the stated criteria, each contact was asked to identify 6 to 8 participants willing to complete the requirements within one-week of receiving the materials. Setting a maximum on the number of participants supplied by any particular organization reduced the potential for company-specific results and improves generalizability. To further improve the generalizability of the study, organizations were selected from a variety of industries to minimize the possibility of industry-specific results.

5.4 Dependent Variables

5.4.1 Goal Commitment

No consensus is found in the goal-setting literature regarding the measurement of goal commitment and only recently have efforts been made to address construct validity issues (e.g. Hollenbeck et al. 1989a; Wright et al. 1994). Table 3 shows the measures commonly used in recent studies. Hollenbeck et al. (1989a) developed a nine-item self-report scale (Table 3, combination 1), which was subsequently used by Wright (1992) who reported a reliability estimate of .83.[22] Several studies have used a seven-item subset (Table 3, combination 2) of the nine-item scale including Klein (1991), Klein and Kim (1998), Klein and Wright (1994) and Wright and Kacmar (1995). Reliability estimates in these studies range from .74 to .91.

More recently, Deshon and Landis (1997) have questioned the content validity of the 7-item and 9-item scales proposed by Hollenbeck et al. (1989a). Deshon and Landis (1997) suggest in addition to goal commitment, these scales represent other constructs. The first four items in Table 3 are inconsistent with the definition of goal commitment

[22] Nunally (1994) recommends a reliability coefficient of .80 for multi-item scales.

used in this study: "the determination to try for a goal and the persistence in pursuing it over time" (Hollenbeck et al. 1989b). The first two items could represent perceptions of goal difficulty, the third item appears to require an assessment of performance expectancy and the fourth item may relate to the value placed on goal attainment. These inconsistencies are problematic since all items included in the measurement of a construct should be determined by its definition (Hopkins, Stanley, Hopkins, Ross and Stanley 1998). Because some of the first four items in Table 3 may be more reflective of goal commitment antecedents (i.e. efficacy and goal attractiveness) their inclusion compromises the content validity of the measure. Deshon and Landis (1997) also report evidence suggesting the original scale developed by Hollenbeck et al. (1989a) is not unidimensional. Confirmatory factor analysis reveals two distinct constructs they label performance expectancy (Table 3, items 1-3) and goal commitment (Table 3 items 5-9). The reliability estimate for the five-item subset (Table 3, items 5-9) related to goal commitment is .88. Because the 5–item scale recommended by Deshon and Landis (1997) has both theoretical and empirical support, it was used to measure goal commitment in this study.

Participants rated their agreement with each of items 5-9 in Table 3 using an 11-point Likert-type scale. The scale ranges from –5 (strongly disagree) to +5 (strongly agree). Schwarz (1996) recommends use of negative-positive scale endpoints whenever the dimension being measured is bipolar; meaning the absence of one dimension (e.g. success) represents the presence of another (e.g. failure). Supporting the recommendation, Schwarz (1996) reports findings from a study indicating participants interpreted the endpoint "not at all successful" as meaning failure when assigned a

negative value (-5). When the same end point was assigned a value of 0, participants interpreted it to mean lack of success, rather than the presence of failure. Because the scale in this study measures a bipolar dimension (absence of agreement implying the presence of disagreement) the negative-positive endpoint values were used.

The decision to use an 11-point scale was based on a review of the measurement theory literature. No apparent consensus exists as to the appropriate length of a scale but Lissitz and Green (1975) and Oaster (1989) show scale reliability improves as the number of response alternatives increases.[23] Rotter (1972) suggests scales with too few response alternatives are less effective in discriminating among individuals. Similarly, Hulbert and Lehman (1972) offer that requiring individuals to respond to a continuous variable on a discrete scale causes 'rounding' errors; the larger the number of scale points the smaller the error. Given the potential advantages of offering more response alternatives, the 11-point scale is used in this study.

The same items in Table 3 were separately used to measure commitment to the SPMS financial and non-financial goals presented in the case materials. Goal commitment was measured for the entire set of non-financial goals instead of each individual goal. This approach is justified because the focus of this study is on the overall causal-linkages contained in a SPMS, not the relationships among individual objectives and performance measures.

5.4.2 Personal Goals

The other dependent variable in this study is participants' personal goals for the SPMS financial performance measure. Participants were asked to indicate which of 7

[23] Matell and Jacoby (1971,1972) present conflicting evidence showing the number of scale points affects neither the reliability coefficient nor the proportion of the scale used.

goal levels they would recommend for the SPMS revenue growth goal. The scale end points were 35% and 95% with increments of 10% (the proposed goal in each of the two cases is revenue growth of 75%). The selection of values was based on pre-test results indicating participants' responses would range from about 40% below to 20% above the revenue growth goal proposed in the cases. Consistent with prior goal setting research (e.g. Brown et al. 1998; Earley 1986) participants were also permitted to select their own goal level if they believed none of the 7 choices was appropriate.

5.5 Independent Variables

5.5.1 Strength of SPMS Causal-Linkages

The strength of the SPMS causal-linkages is manipulated within Ss using two levels, strong and weak. Causal-linkages represent the cause-effect relationships between the non-financial and financial objectives and performance measures contained in a SPMS. According to Kaplan and Norton (1996), the two steps in identifying SPMS content are:(1) determine the customer values that must be met in order to attain financial objectives; and (2) identify the internal processes and employee skills needed to deliver on those values. The approach used to manipulate the strength of the causal-linkages is based on these two steps. In each case participants are provided with specific information about customer values and the employee skills needed to deliver those values. Causal-linkage strength is manipulated by varying the degree to which the objectives and performance measures correspond with the identified customer values and employee skill requirements. In the "strong" causal-linkage case the objectives and performance measures are closely related to the customer values and required employee skills. In the "weak" causal-linkage case they are not.

Figure 7 shows details for the "strong" causal-linkage SPMS case. Before the SPMS details are presented, the case identifies the key customer values and employee requirements shown at the bottom of Figure 7. In the "strong" causal-linkage case the SPMS non-financial objectives and performance measures are closely aligned with the drivers of revenue growth. For example, the case indicates customers' value security and functionality, and the SPMS includes a security/functionality performance measure. Similarly, the case states that to meet customer values, training is needed for programmers; the "employee" objective and performance measure reflect this requirement. To make the strength of the causal-linkages more salient to participants the non-financial objectives and measures use terminology consistent with the customer values and employee requirements (e.g. "skills", "functionality", "security", "key requirements"). Links among the non-financial objectives and measures are also designed to be plausible in the "strong" causal-linkage condition. For example "developing a reliable and functional Home Banking product" could reasonably be expected to lead to the objective "satisfy key requirements of Home Banking customers". The objectives and performance measures used in the "strong" case are based on the SPMS literature review and details from an interactive balanced scorecard simulation program (Kaplan and Norton 1999). Pre-test results show participants believe the Figure 7 non-financial objectives and measures are strongly linked to the revenue growth goal.

Figure 8 summarizes the details for the "weak" causal-linkage SPMS case. The "weak" causal-linkage case has the same total number of non-financial objectives and performance measures as the "strong" case. This was done to ensure that differences in the perceived strength of the causal-linkages contained in the two cases are not

attributable to an imbalance in the number of objectives and measures. In the "weak" case none of the non-financial objectives and performance measures are intended to address the identified customer values or employee requirements (shown at the bottom of Figure 8). For example, the case indicates employees require advanced training to deliver on customer values but the objectives and performance measure focus on employee suggestions. Customers value security and website appeal, but the objectives and measures address staff friendliness and openness issues. The Figure 8 cause-effect linkages among the non-financial objectives and measures are also designed to be weak. For example, the link between staff showing up for work on time and their image with the customer is likely to be weak. So too is the relationship between the percentage of employees making suggestions and the percentage of days they report to work on time. Feedback from the final round pre-test round participants indicates the Figure 8 objectives are weakly related to financial performance.

5.5.2 Non-Financial Goal Achievability

The achievability of the SPMS non-financial goals is manipulated between Ss. Consistent with prior research that has manipulated self-efficacy beliefs (e.g. Whyte, Saks and Hook 1997), participants are told, based on their experience at ECB, the likelihood of achieving the non-financial goals was either 60% (Figure 6, Group B: moderate achievability) or 15% (Figure 6, Group A: low achievability). The achievability values are similar to the probabilities used by Nelson and Kinney (1997) to establish a reasonable (.55) and low probability (.15) of a lawsuit loss. They are also consistent with the average values assigned to outcomes described as "probable" and "low" found in previous research (Amer, Hackenbrack and Nelson 1995). Further, pre-test results show

.60 and .15 are within the range of probabilities assigned to performance goals with, respectively, moderate and low likelihoods of achievement.[24] A high level of achievability (e.g. 80%-90%) was not employed because of the risk that uniformly high levels of commitment might result, leaving little room for the causal-linkage manipulation to have the predicted effects.

Two steps were taken to establish the plausibility of the non-financial goal achievability manipulation. First, the cases indicate the likelihood of achievement is based on an assessment of several factors including time constraints, availability of resources and controllability of factors affecting goal achievement. Second, information is provided about current performance levels for each of the non-financial measures. Several pre-test participants suggested this step; they indicated that data on current year performance levels would help establish the plausibility of the achievability manipulation. The gap between current year estimates and the performance goals is considerable in both achievability conditions. However in the low achievability condition, most of the current year estimates are about half the level of those in the moderate achievability condition.

5.5.3 Manipulation Checks for the Independent Variables

To assess the effectiveness of the SPMS causal-linkage manipulation several measures were collected. The first measure consists of a series of questions asking participants whether they agreed with the plausibility of each of the cause-effect relationships proposed in the SPMS. Participants could respond "agree", "disagree" or

[24] Pre-test participants were asked to indicate the range (lower and upper) they would assign to performance goals with a low, moderate and high likelihood of achievement. The means for the lower and upper bounds, respectively for low, moderate and high were: 4%-27%; 37%-72%; and 73%-97%.

"not sure". The primary purpose of these questions was to encourage participants to carefully consider the SPMS contents before responding to the manipulation checks described below. However, responses to these questions also provide a preliminary assessment of how well the manipulation worked. Evidence of an effective manipulation would be a high (low) number of "agree" responses relative to "disagree"/ "unsure" in the "strong" ("weak") causal-linkage case. Participants were allowed to review the SPMS content pages while answering these questions.

Three primary measures were used to evaluate the success of the SPMS causal-linkage manipulation. The first two measures required participants to separately rate their agreement (11-point scale: +5 = strongly agree; -5 = strongly disagree) with two statements: (a) The SPMS identifies non-financial objectives that should lead to the objective of increasing revenues; and (b) The SPMS identifies a set of non-financial performance measures that should lead to the goal of increasing revenue by 75%. The third measure asked participants to rate the strength of the link between performance on the non-financial measures in the proposed SPMS and revenue growth (7-point scale: 1 = very weak; 7 = very strong). For each measure, higher scores for the strong causal-linkage condition will be evidence of a successful manipulation.

To assess the effectiveness of the non-financial goal achievability manipulation two measures were used. First, participants were asked whether they believed the proposed goals for the non-financial measures could be achieved: "yes" or "no". Second, participants were asked to estimate the percentage probability (0-100%) of achieving the set of non-financial performance goals. This probability estimate represents a single-item measure of participants' self-efficacy for non-financial goal achievement. Evidence of a

successful non-financial goal achievability manipulation will be provided by: (1) a higher proportion of "yes" responses in the "moderate" achievability condition; and (2) a higher probability estimate in the "moderate" condition.

5.6 Other Variables Measured or Controlled

5.6.1 Mediating Variables

Financial goal self-efficacy is predicted to mediate the effects of causal-linkage strength (H6a-b) and non-financial goal achievability (H7a-b) on goal commitment and personal goal decisions. Financial goal self-efficacy was measured by asking participants: (1) whether they believed they could achieve each of five different performance levels for revenue growth (45% to 85% in increments of 10%), "yes" or "no"; and (2) to estimate the probability of achieving each of the five performance levels. The values of 45% to 85% are based on pre-test results that show these end-points qualitatively span the range of easy to very difficult. Self-efficacy strength is commonly calculated by summing either: (1) the probability estimates for all five goals; or (2) the estimates for only the "yes" responses (Lee and Bobko 1994). The latter approach to measuring self-efficacy is recommended by Bandura (1997) and has been applied in numerous goal-setting studies (e.g. Bandura and Jourden 1991; Cervone, Jiwani and Wood 1991). However, Lee and Bobko (1994) show both measures correlate highly with the antecedents and consequences of self-efficacy and neither method has a superior theoretical basis. Accordingly, both measures will be assessed in tests of the mediation hypotheses.

Non-financial goal attractiveness is predicted to mediate the effects of causal-linkage strength on non-financial goal commitment (H6c). A single-item measure was

used to assess non-financial goal attractiveness. Participants were asked to rate the attractiveness of attaining the set of SPMS non-financial goals on an 11-point scale (-5 = very unattractive, +5 = very attractive). The single-item measure was used in favour of a multi-item approach where participants rate the attractiveness of achieving several different performance levels (Klein 1991). The single-item measure was used because of the likelihood that participants would have been overwhelmed by a requirement to separately rate the attractiveness of several goal achievement levels for each of the five non-financial performance measures used in the two cases. In a comparison of the single and multi-item measures of goal attractiveness, Klein (1991) finds both approaches explain a similar proportion of the variance in goal commitment and personal goals.

5.6.2 Ability

Chapter 3 identified ability as an antecedent of goal commitment and personal goal decisions. Consequently, between-group differences in ability could affect the results in this study. To control for this possibility, the self-report measure of ability developed by Mahoney, Jerdee and Carroll (1965) was collected for use as a covariate in the analysis. A more objective rating of ability (e.g. from a supervisor) was not feasible since participants were drawn from a variety of areas within each organization limiting the opportunity to identify the appropriate supervisor to complete an ability assessment. Although self-reported ability measures may be subject to an upward bias or halo effect, Shields et al. (2000) report findings from several studies indicating significant positive correlations exist between 'objective' ability measures and self-ratings.

Participants rated their ability on 8 managerial tasks (planning, investigating, coordinating, evaluating, supervising, staffing, negotiating, and representing) as well as

their overall managerial ability. This measure is appropriate since the ability dimensions are reasonably consistent with factors likely to affect a manager's success in achieving performance goals. Mahoney et al. (1965) suggest the ability measure should meet two criteria: (1) the eight sub-dimensions should be independent; and (2) variability in the eight dimensions should explain at least 55% of the variance in the overall rating. To evaluate the independence criterion, the pair-wise correlations between the eight dimensions will be compared to the correlation between each dimension and the overall ability rating. Consistent with prior research, if the dimensions are more highly correlated with the overall measure than with each other, this will be considered evidence of reasonable independence (Brownell and McInnes 1986; Kren 1992). To evaluate the second criterion, the overall rating of ability will be regressed on the 8 sub-dimensions; if the explained variance exceeds 55%, the second criterion will be met (Chong and Chong 1999; Brownell and McInnes 1986). As a second measure of ability, participants were asked to provide a percentile ranking (e.g. top 10%) of their overall managerial ability relative to other managers in their organization. Each ability measure will be evaluated as a covariate in the hypotheses tests presented in Chapter 6.

5.6.3 Controlled Variables

Difficulty of Financial and Non-Financial Goals. Although the objective difficulty of a goal and individuals' subjective beliefs about its achievability are separate constructs in the goal-setting literature, they are likely to be negatively correlated. To the extent this negative correlation exists, differences in goal difficulty between the two cases could lead to differences in achievability beliefs. To avoid this potential confound, it was necessary to equate the difficulty of the financial and non-financial goals for the two

cases to ensure differences in goal commitment and personal goals can be attributed to the manipulation of causal-linkage strength. To establish similar levels of goal difficulty for each case a rating system is used. The difficulty of financial and non-financial goals were rated on a 10-point scale (1= very easy; 10 = very hard); in both cases, each goal is given a rating of "9". This approach is based on the system used at Mobil Corporation where performance goals are assigned an objective difficulty rating during the goal-setting process (Kaplan 1997). Discussions with several pre-test participants led to the provision of background information to support the difficulty rating. The cases indicate the difficulty rating is based on an assessment of the timeframe for achieving the goal, the competitive environment and industry benchmarks.

To further control the perceived difficulty of the financial goals, two additional steps were taken. First, as discussed in section 5.2.3, a revenue growth goal is used in each case. Second, in each case the level of the revenue growth goal is set at 75% because some pre-test participants indicated that differences in the level of the goal might create unintended differences in perceptions of goal difficulty. A similar approach is used for the non-financial goals where the possible levels of non-financial goals are similar in each case.[25] To check the effectiveness of the goal difficulty control, in each case participants were asked to indicate their level of agreement with the statement that the proposed goals (separate measure for financial and non-financial) are difficult (11-point scale: -5 = strongly disagree; +5 = strongly agree).

Attractiveness of Financial Goals. Because the attractiveness of a goal can affect goal commitment and personal goal decisions it was also necessary to control the

[25] This was not always possible since the metrics for the non-financial measures in the two cases were not completely consistent.

attractiveness of the financial goals across the two cases. To establish similar levels of financial goal attractiveness for each case, the materials describe a reward system where managers' bonuses are directly affected by achievement of the SPMS financial goal. Each case indicates failure to achieve the 75% revenue growth goal (same in each case) will have a negative impact on a manager's bonus. The materials further indicate that non-financial goals are only rewarded to the extent they lead to the achievement of the financial goal. To assess the effectiveness of the financial goal attractiveness control, participants were asked to rate the attractiveness of achieving the financial goal in each case (11-point scale: -5 = very unattractive; +5 = very attractive).

Controllability of Non-Financial Performance Measures. Previous research shows perceived control, or the degree of influence managers believe they have on the outcome of a performance goal, can affect self-efficacy, goal commitment and personal goal decisions (Bandura and Wood 1989; Klein and Kim 1998). Because of these findings controllability of outcomes on performance measures is a factor specifically mentioned in the case materials as affecting the estimate of goal achievability (i.e. 15% or 60%). Since the achievability of the non-financial goals is the same for the two cases each participant completes, perceived control is not expected to differ significantly within Ss.[26] However, if participants do not view the two sets of non-financial performance measures as equally controllable, any differences could confound the effects of the causal-linkage manipulation. To determine whether differences in perceived control exist between the two cases participants were asked to rate, on a 7-point scale, the amount of

[26] Perceived control differences between the two non-financial goal achievability conditions is possible since control of factors affecting outcomes is identified as a factor affecting the achievability estimate.

control they believed they would have on the outcomes for the set of non-financial performance measures (1= not all controllable; 7= very controllable).

5.6.4 Participants' Understanding of the Reward System

Two measures were used to assess participants' understanding of the reward system details. One measure required participants to indicate their level of agreement with the statement that bonuses are directly affected by achieving the revenue growth goal (11-point scale: -5 = strongly disagree; +5 = strongly agree). Using the same type of response scale, the second measure asked participants to record their level of agreement with the statement that performance on non-financial measures is only rewarded to the extent it contributes to achievement of the financial goals. Positive responses (i.e. > 0) to each measure will be interpreted as evidence participants understood the reward system details.

5.6.5 Other Measured Variables

Table 4 summarizes the questions used to provide information about participants' background and details about their company. This information was gathered primarily for descriptive purposes however several variables were measured because of their potential relation with the dependent variables (see Table 4 for scale descriptions). Given the nature of the case settings it is possible that participants' familiarity and experience with electronic commerce settings could affect their goal commitment and personal goal decisions. Similarly, whether they had experience with the type of SPMS used in the cases might also affect their responses. The effects of each measure on the dependent variables will be analyzed in Chapter 6. Three questions were used to assess participants'

overall reaction to the materials. Participants were asked to separately rate the realism of the case settings, the understandability of the materials and the difficulty of the case requirements. Each question uses a 7-point scale.

5.7 Materials Design and Administration

5.7.1 Design

The experiment materials were designed using Microsoft Access® for the database version and Microsoft Front Page® for the Internet version. The decision to develop an "electronic" instrument was based on the type of participants used in this study. Given the time demands on managers and because they were drawn from several organizations, it was necessary to administer the experiment in the field; it was impractical to have all managers complete the materials at a central location. The primary advantages of the approach were: (1) it permitted an effective method of remote administration; and (2) it allowed control over key aspects of the presentation and completion of the materials.

Several programming features were used to monitor and control the conditions under which participants completed the materials. First, both versions recorded the total time taken to complete the materials. This allows detection of any participants significantly above or below the average total response time. Second, to standardize the way in which the cases were seen and completed by participants, each version was programmed to control the order materials were presented and to allow participants to return to key materials as needed. Third, controls were developed to prohibit participants from leaving a page without responding to every question; a prompt reminded participants to go back and complete the specific question missed. Finally, the materials

were programmed to prevent participants from re-entering responses if, for some reason, they closed and re-opened the file. Once a response was provided for any question, the file would not save any attempt to answer the question again. None of these control features could have been implemented using a standard 'paper and pencil' instrument.[27]

5.7.2 Administration

Each company that agreed to take part in the study provided email addresses for their participants. Participants using the database version received the file as an email attachment along with a detailed set of instructions for opening, completing, and returning the file. All responses were automatically stored in the database file, which participants returned as an email attachment. Pre-testing showed this approach worked well and participants found it convenient. Participants using the Internet version were sent a website address, a unique username, password, and completion instructions. All responses were automatically saved to a database on a web server. Access to the response files was password restricted; only the author, a research assistant and the network administrator had access to the password. Responses were backed up daily to the author's personal computer.

Participants were asked to block off about 75 minutes to complete the materials and not to discuss the contents with anyone else in their organization. As per University of Alberta research ethics requirements, before completing the materials, participants were sent a one-page statement outlining the purpose of the study, requirements and task

[27] Two additional monitoring features developed for the database version were not implemented in the internet version because of programming complications: (1) the elapsed time spent on each page was recorded in a data table; and (2) page numbers were recorded in a data table in the order they were accessed.

details. A copy of the statement is included in Appendix 2. Participants were assured confidentiality and anonymity of results.[28]

Four different versions of the materials were prepared: two for each non-financial goal achievability condition. Half the participants in the low achievability condition received the strong causal linkage case first; the other half received the weak causal-linkage case first. The same approach was used for the moderate achievability condition. This precaution was taken to assess whether "case-order" affected participants' responses to the key measures.

5.8 Experiment Procedures

Table 5 summarizes the experimental procedures. For both versions of the instrument instructions were provided on the first page. Participants navigated through the materials by clicking on buttons programmed to advance to the next page, the previous page, or other specific pages in the file. No previous experience with Microsoft Access® or Internet browser software was required to complete the procedures.

[28] Although the participants were not anonymous to the author, they were assured that neither their name, nor their company's name would be reported with the research findings.

CHAPTER 6

RESULTS

6.1 Demographic Information about Participants and their Employers

A total of 82 (41 database version; 41 internet version) sets of materials were distributed through company contacts. Sixty-three participants (32 database version; 31 internet version) completed all or part of the materials for a total response rate of 77%. Of the 63 responses, 56 were usable for a net response rate of 68%.[29]

Table 6 summarizes demographic information about the participants, their reaction to the materials and details about their employers. Panel A of Table 6 shows participants average full-time work experience is nearly 19 years (range 3 – 36 years) and they have been with their current employers an average of 12 years (range 1-29 years). Participants also have considerable supervisory responsibilities; the average number of employees supervised is 18 (median 6.5). Overall participants indicated they were moderately familiar with the e-commerce settings employed in the cases (mean 4.2 on a 7-point scale). On average participants had limited professional e-commerce experience (mean 3.2 on a 7-point scale) and 50% indicated low or no e-commerce related work experience (frequencies not shown in Table 6). However, about 25% of respondents reported having a moderate to high degree of e-commerce professional experience (5 or higher on the 7-point scale).

The job titles provided by participants (Table 6, Panel A, item 2) suggest a level of seniority consistent with their considerable work experience. Nearly half of the participants (46%) described themselves as a manager of a functional area (e.g. Product Manager, Logistics Manager) and a further 24% indicated they were an area vice

[29] A usable response was one where the participant completed both cases.

president (e.g. V.P. Group Insurance, V.P. Finance) or director (e.g. Director Marketing, Director Business Integrity). Most (21%) of the remaining of participants provided a job title consistent with a leadership role: supervisor, senior and leader. The majority of participants (80%) are well educated possessing either an undergraduate or masters degree (Table 6, Panel A, item 3). Finally, nearly all participants (92%) are responsible for achieving performance goals in their organizations. Overall the participants' background is consistent with the criteria outlined in section 5.3.1.

Participants' general reactions to the case materials are summarized in Table 6, Panel B. On average they believed the case scenarios were reasonably realistic (mean 4.4 on a 7-point scale) and understandable (mean 5.0). Participants did not appear to find the requirements particularly difficult to understand (mean 3.1).[30] Consistent with the pre-test results, the case materials took an average of 70 minutes to complete.

Table 6, Panel C provides descriptive information about participants' employers. Item 1 indicates a reasonable cross-section of industries is represented in the sample. The largest number of participants came from the banking industry (23%) followed closely by insurance and natural resources (20% each). The utilities and retail industries represent, respectively, a further 17% and 11% of the sample population. Information about the size of the sample companies is shown in Table 6, Panel C. The companies tended to be large with median values of 3,000 employees, $200 million in revenue and $10 billion in assets (item 2).[31] Although not a prerequisite for inclusion in the sample, the majority (71%) of participants' employers use a SPMS with characteristics similar to those presented in the two case scenarios (Table 6, Panel C, item 3) with over half of them in use for more than

[30] See Table 6 for a description of the response scales for the Panel B items.
[31] Median values are reported because the two large financial institutions included in the sample distort the means for these items.

5 years (Table 6, Panel C, item 4). Item 5 indicates participants whose companies use a SPMS believe it is useful. The mean usefulness rating was nearly 5 on a 7-point scale.

An analysis was conducted to determine if between-group differences exist for any of the Table 6 variables. The four groups examined for differences were: non-financial goal achievability ("achieve": high or low non-financial goal achievability); administration version ("version": database or Internet); causal order ("order": weak or strong causal-linkage case first); and company type ("company": financial services or non-financial services). "Company" was included because the cases used in the experiment involve a financial services company and participants from that industry may be more familiar with the case context and react differently than those less familiar. For purposes of the analysis participants from the banking and insurance industries were classified as "financial services" with the remaining participants grouped as "other". Significant main effects for "achieve" will indicate the need to assess the effects of the variable as a covariate in hypothesis testing. For the remaining factors, significant main effects or 2-way interactions with "achieve" will indicate the need to evaluate the impact of that factor on hypotheses tests. The χ^2 test of association was used to check for the existence of between group differences for the Table 6 categorical variables: education; responsible for achieving goals; industry ("company" excluded); SPMS use; and number of years SPMS used. The remaining variables were analyzed using parametric (ANOVA) and non-parametric procedures (Kruskal-Wallis (K-W) and the χ^2 Median test).[32]

The χ^2 tests of association show no significant differences between any of the groups for the categorical variables. For the remaining variables, the ANOVA models

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[32] Consistent with convention, the analysis conducted in Chapter 6 applies the criterion $\alpha = .05$ in deciding whether a statistical test is significant (Glass and Hopkins 1996; Stevens 1996).

and non-parametric procedures indicate five of the Table 6 measures differ significantly between groups.[33] Participants from financial services companies were significantly ($F = 12.04$, $p < .001$) more familiar with e-commerce settings than non-financial services participants (5.3 versus 3.4 on the 7-point scale). Similarly, financial services participants reported having significantly ($F = 16.70$, $p < .001$) more e-commerce work experience than their counterparts (4.2 versus 2.4). The participating financial services companies are also larger than the other companies in terms of total revenues, assets and employees (respectively $F = 22.68$, $p < .001$; $\chi^2 = 10.73$, $p < .001$; $F = 23.7$, $p < .001$). As a result of these differences, the impact of "company" will be evaluated as a between Ss factor in tests of the hypotheses.

6.2 Goal Commitment Measures

The 5-item measure used to assess financial and non-financial goal commitment were described in section 5.4.1. Two steps were taken to evaluate the dimensionality and reliability of the 5-item measure. First, a principal components analysis was performed on each measure to determine if one or multiple factors emerge. Second, Cronbach's Alpha was calculated to determine the extent to which the 5 items correlate with each other (Glass and Hopkins 1996). Rather than aggregating data across the two cases, a separate analysis was performed on each goal commitment measure for each case ("weak" and "strong" causal-linkages). This approach allows an evaluation of each measure for each case.

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[33] Except for the "number of employees supervised" and the company size variables, the ANOVA assumptions of normality and homogeneity of variance were satisfied for each variable. For those variables that violated the ANOVA assumptions, non-parametric tests (K-W, and Median test) produced significance levels similar to those reported for the parametric procedures.

A correlation matrix was calculated for each goal commitment measure for each of the two cases (Table 7). The existence of significant inter-item correlations supports the use of principal components analysis (Hatcher and Stepanski 1999). Table 7 shows uniformly high correlations among the five items included in each of the measures ($p < .005$ for each pair). Therefore the application of principal components analysis to the data appears appropriate and given the high pairwise correlations it is unlikely the goal commitment measure captures multiple constructs.[34]

The results of the principal components analysis are summarized in Table 8 (Panel A). Factor loadings based on the correlation matrices are shown for the first two factors produced for each of the four measures. The results show each of the five items loads highly on the first factor. The most commonly used criterion in evaluating the results of principal components analysis is to retain only those factors whose eigenvalues are greater than 1 (Jobson 1992; Stevens 1996). The results in Table 8 show each of the four goal commitment measures has an eigenvalue of 3.5 or greater for the first factor and all of the eigenvalues for the second component are below 1. As an additional criterion, Stevens (1996) suggests using a critical value of .72 for determining the significance of individual loadings, where $\alpha = .01$ and $n = 50$. Using this conservative criterion, all loadings are significant for the first factor. Conversely, using .72 as the cut-off, none of the loadings for the second factor are significant. Finally, Stevens (1996) recommends the total variance (of the individual items) explained by the factor solution should be 70% or greater. Table 8 indicates the variance explained by the first factor for each measure

[34] Bartlett's sphericity test was performed for each of the four correlation matrices in Table 7. Bartlett's procedure tests the null hypothesis that the variables in the sample correlation matrix are uncorrelated (Stevens 1996, pg. 365). The null hypothesis was rejected for each of the four matrices ($p < .001$) indicating each correlation matrix is not an identity matrix.

exceeds 70%. Based on the three criteria outlined above the 5-item scale used in this study appears to represent a single construct. Each item loads significantly on the first factor, the eigenvalues exceed 1 and the variance explained by the single factor solution exceeds 70%.[35]

To provide a measure of scale reliability, Cronbach's coefficient alpha was calculated for the 5-item goal commitment measure. The coefficient of reliability (r) is calculated according to the following formula (Hatcher and Stepanski 1999):

$$r = (N)(N-1) \times (S^2 - \Sigma S^2_i)/(S^2)$$

where:

N = number of items in the instrument.
S^2 = variance of the summated scale scores.
ΣS^2_i = sum of the variances of the items included in the scale.

High correlations among scale items will result in a small value for ΣS^2_i and a high value for r. High values for r are indicative of greater scale reliability.[36] The coefficient alphas for the goal commitment measures are shown in Table 8. Each alpha is well above the .80 suggested by Nunally (1994) as desirable indicating a high level of scale reliability.

Based on the results of the principal components analysis and the magnitude of the coefficient alphas, the 5-item goal commitment measure appears to represent a single construct with high scale reliability. Accordingly, participants' responses to the five scale items will be averaged to form measures of non-financial goal commitment and financial goal commitment for each case (DeShon and Landis 1997; Klein and Kim 1998).

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[35] The principal components analysis was re-performed using the covariance matrices and the results do not differ qualitatively from those reported in Table 8.

[36] A high r-value does not necessarily indicate a unidimensional construct. High correlations among some, but not all, measures of a scale can result in a high r-value even though the scale captures more than one construct (Hattie 1985).

6.3 Measures of Managerial Ability

The two self-reported measures of ability collected in the study were described in section 5.6.2. The first measure required participants to rate their managerial ability on 8 different dimensions as well as their overall ability (Mahoney et a. 1965). Table 9 (Panel A) summarizes descriptive statistics for each of the 8 dimensions as well as the overall rating. Participants rated themselves highly on each measure with 7of the 8 means exceeding 5 (7-point scale). The ratings are consistent across participants as shown by the low standard deviations on each dimension.

Consistent with prior research (Brownell and McInnes 1986; Kren 1992) the independence of the 8 dimensions was evaluated by comparing the pairwise correlations among the eight dimensions to the correlation of the dimension with the overall rating (see 5.6.2). Table 9 (Panel B) shows that only 4 pairwise correlations violated the independence rule of thumb (items in bold). This is consistent with the findings of Brownell and McInnes (1986) and Kren (1992) who report 3 and 4 violations respectively. The second criterion for evaluating the measure is that the 8 dimensions should explain the majority of the variance in the overall rating (Mahoney et al. 1965). To test this criterion the overall rating was regressed on the 8 dimensions and the resultant R^2 was 77%.[37] The R^2 value corresponds closely with the 78% and 76% reported by Brownell and McInnes (1986) and Kren (1992). The foregoing analysis indicates the Mahoney et al. (1965) measure captures independent dimensions of performance that are highly correlated with overall performance. Accordingly, the overall

[37] The overall regression model was significant at the .001 level. An examination of collinearity diagnostics (variance inflation factors and condition indices) indicates multicollinearity is minimal. Analysis of the residuals shows they are normally distributed with constant variance. A review of influence diagnostics (Cook's D, standardized residuals) indicates no outliers.

measure of performance will be evaluated as a covariate in the models used in hypotheses testing.

The second ability measure collected was participants' percentile rating of their overall ability relative to other managers in their company. Table 9 (Panel A) reveals participants rated their ability in the top quartile relative to their peer group (mean 24.8%). Compared to the 8-dimension measure, the percentile rating shows higher variation among participants, as evidenced by the relatively large standard deviation (17.9%). The percentile rating is also significantly correlated to the overall measure of ability ($r = -.33$, $p < .05$). Consequently, the percentile rating of ability will also be evaluated as a covariate in the hypotheses tests.

6.4 Results for controlled variables

The four variables controlled between the two cases were described in Section 5.6.3. Table 10 presents the descriptive results for these variables for each case (Panel A). In each case, participants agreed the assigned financial goal was difficult (Table 10, Panel A, item 1). The mean level of agreement in each case (Panel A) is significantly greater than the neutral scale mid-point ($p < .001$, parametric t-test and non-parametric Sign test).[38] Participants also agreed the assigned financial goal would be attractive to achieve (Table 10, Panel A, item 2). In each case the mean level of agreement is significantly greater than the neutral scale mid-point ($p < .001$, parametric t-test and non-parametric Sign test). These results show the objective of establishing difficult financial goals that would be attractive to achieve was accomplished in each case.

[38] See Table 10 for a description of the scale used for each measure.

Table 10 (Panel A, item 3) shows participants believed the non-financial goals were moderately controllable in each case with means of 4.3 and 4.9 respectively for the low and high causality cases (7-point scale where 7 = very controllable). The average ratings for non-financial goal difficulty are shown in Table 10, Panels A (item 4). For each case the mean level of agreement is significantly greater than the neutral scale mid-point ($p < .001$, parametric t-test and non-parametric Sign test). These findings indicate participants believed the non-financial goals assigned in each case were difficult.

To test whether participants' responded similarly to each measure in both cases, paired comparisons (parametric and non-parametric) were performed and no pattern of significant differences emerges. A repeated measures ANOVA was also performed for each control variable using the between Ss factors described in section 6.1 and participants' responses to each measure as the dependent variable. The repeated measures approach was used to test for the significance of: (1) within Ss differences; (2) between group differences across the two case; and (3) interactions of the between and within Ss factors.

Because the residuals from the models violate the ANOVA assumptions (negative skewness) each dependent variable was transformed using the formula $y = x^k$ where: Y = the transformed value, x = the untransformed value, and k = 3. To remove negative skewness Jobson (1992) recommends power transformations with k values >1.[39] Using the transformed values for the dependent variables, the residuals satisfy all ANOVA assumptions. Results of the repeated measures ANOVA using the transformed variables indicate no significant interactions of the between and within Ss factors. The results also

[39] Before transforming the dependent variables a constant (6) was added to each response for measures using a scale with endpoints –5 and +5.

show no significant main effects for the within Ss factor or any of the between Ss factors except "version". Participants who completed the Internet version of the materials believed the financial goals were more attractive than those who received the Access version. Respectively the means for the two groups were 3.7 and 2.2 ($F=4.99$, $p < .05$). Given this difference "version" will be evaluated as a between Ss factor in hypotheses tests.

6.5 Participants' Understanding of Reward System Details

Participants' understanding of reward system details was evaluated using the two measures described in section 5.6.4. The results and scale details are shown in Table 10 (Panel B). A positive value on the response scale indicates agreement, which given the wording of the measure, is considered evidence that participants' accurately understood the reward system details. To test the significance of the understanding, the means for each measure were individually compared to the neutral scale mid-point (0) for both cases. Parametric (t-test) and non-parametric (signed rank test, sign test) procedures show all means are significantly greater than the mid-point ($p< .01$). Separate tests were also performed on the two measures for each of the between Ss factors ("achieve", "order", "version", "company"). For each level of the between Ss factors the means are significantly greater than the scale mid-point (t-tests: all p- values $< .01$; Signed rank test and Sign test: all p-values $< .05$). This indicates, overall, participants in all between Ss conditions understood the details of the incentive system used in the cases.

Using the two measures as a set, a repeated measures MANOVA was conducted to test for differences within and between Ss.[40] The multivariate approach is appropriate since both measures are testing participants' understanding of the incentive system and they are significantly correlated ($r = .58$, $p < .01$). The repeated measures analysis was used to test for the significance of: (1) within Ss differences; (2) between Ss differences; and (3) interactions between (1) and (2). The only significant result is the between Ss main effect for "order" ($F=3.27$, $p < .05$). A review of the univariate test results shows participants who received the "weak" causal-linkage case first expressed stronger agreement ($F=6.77$, $p < .05$) to the statement "performance on non-financial goals is indirectly rewarded by the incentive system" that those who received the "strong" case first (respectively means of 2.7 and 1.7). This difference does not appear to be problematic since the means for both "order" versions are significantly greater than the scale mid-point ($p < .005$, parametric and non-parametric tests) indicating an understanding of the incentive system details. However, as a precaution, "order" will be included as a between Ss factor in tests of the hypotheses.

The preceding analysis indicates participants understood the details of the reward system. However, the standard deviations in Table 10 (Panel B) indicate a relatively high variation (mean 1.82, standard deviation 2.84) in participants' responses to item 2 in the "weak" causal-linkage case. A review of responses shows 10 participants disagreed with the statement "non-financial goals are only rewarded to the extent they contribute to achieving the financial goal" in the "weak" causal-linkage case but agreed with the statement in the "strong" causal-linkage case. Disagreement could be interpreted to mean

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[40] A power transformation of the dependent variables ($y = x^3$, Jobson 1992) was used to satisfy the repeated measures MANOVA assumptions of normality and homogeneity of covariances.

(1) participants believed non-financial goals would not be rewarded, even indirectly or (2) that non-financial goals could be rewarded even if they did not contribute to financial goal achievement. It is not clear why participants might have formed these alternative interpretations, if indeed they did, since the description of the reward system and the related manipulation checks did not differ across the two cases. However, as a precaution the potential effects of these differences will be analyzed as part of hypotheses testing. A review of responses for item 1 (Table 10, Panel B) shows 2 participants disagreed with the statement "bonuses are directly affected by achieving the financial goal" in the "weak" case but agreed in the "strong" case. The potential impact of this difference will also be addressed when testing the hypotheses.

6.6 Effectiveness of the Independent Variable Manipulations

6.6.1 Manipulation of SPMS Causal-Linkage Strength

In both cases participants indicated whether they agreed, disagreed or were unsure about the plausibility of each of the 7 cause-effect relationships contained in the proposed SPMS. The primary purpose of this section of the materials was to encourage participants to carefully consider the details of the SPMS. However, a review of participants' responses to these items permits a preliminary assessment of the effectiveness of the causal-linkage strength manipulation. Table 11 summarizes the responses to each question in two categories: "agree" and "disagree or unsure." Combining the disagree and unsure categories is justified on the basis that it allows comparison of response frequencies for participants who clearly believed the causal relationship was valid ("agree") to those who did not ("disagree") or had doubts ("unsure").

Panel A of Table 11 presents the frequencies for the "weak" causal-linkage case along with the results of χ^2 tests of relative response frequencies in the two categories.[41] Consistent with the intention of the manipulation, significantly more respondents disagreed or were unsure about the validity of the proposed causal relationship for the first, fifth and sixth items. Response frequencies do not differ significantly for the second, third items and seventh items. These items provide some support for the effectiveness of the manipulation because they indicate a lack of clear consensus about the plausibility of the causal relationships. Finally, significantly more participants agreed that the relationship represented by the fourth item is plausible. This is not particularly surprising since this item asserts that increasing the implementation of employee suggestions will lead to the submission of more suggestions in the future.

Response frequencies and the χ^2 tests for the "strong" causal-linkage case are shown in Table 11, Panel B. Consistent with the objective of the manipulation, significantly more respondents clearly agreed with the plausibility of each proposed causal relationship contained in the "strong" causal-linkage SPMS. For each item, the agree category contains significantly more responses than the combination of disagree/unsure ($p < .001$). Collectively, the analysis of the response frequencies for the seven items in each case indicates the manipulation of causal-linkage strength was reasonably successful.

To examine how participants translated their reactions to the specific items shown in Table 11 into overall assessments of causal-linkage strength, Table 12 presents the results for the three primary manipulation checks described in Section 5.5.3. Each

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[41] The χ^2 procedure tests the null hypothesis that the number of responses in each category is equal.

measure, collected in both cases, required participants to provide an evaluation of the strength of the SPMS causal-linkages. The descriptive results in Panel A indicate the mean of each measure is greater for the "strong" causal-linkage case. Paired comparison tests were conducted for each pair of means in Panel A. For each measure, the "strong" causal-linkage mean is significantly greater ($p < .01$) than the "weak" causal-linkage mean (parametric: t-tests; non-parametric: Signed Rank tests, Sign tests). These results indicate the causal-linkage strength manipulation was effective.

Further analysis was also performed on the measures shown in Table 12 (Panel A) to determine if any of the four between Ss factors identified in section 6.1 interacted with the causal-linkage strength manipulation ("causal"). A repeated measures MANOVA was conducted using the three manipulation checks as the set of dependent variables. Multivariate analysis is appropriate since the dependent variables are significantly correlated (Table 12, Panels B and C) and collectively measure participants' evaluation of the SPMS causal content (Jobson 1992; Stevens 1996).

Table 13 summarizes the result of the multivariate repeated measures analysis for "causal" and its interaction with the four between subjects' factors.[42] The only significant multivariate effect is for "causal" ($F=31.18$, $p < .001$); none of the 2-way interactions are significant. The univariate test statistics (not reported in Table 13) show the "causal" manipulation significantly affected participants' responses on each measure: "Objectives" ($F=68.3$, $p < .001$); "Measures" ($F=55.8$, $p < .001$); and "Overall" ($F=91.5$, $p < .001$). The

[42] Tests (Box's Test: Stevens 1996) show the homogeneity of covariance assumption is met but the residuals are not normally distributed (Kolmogorov-Smirnov, $p < .05$) for the Table 13 model. Using a power transformation ($y = x^3$) on the dependent variables satisfies the MANOVA assumptions; the significance levels do not differ qualitatively from those reported in Table 13.

results reported in Table 13 indicate the causal-linkage manipulation was unaffected by any of the between Ss factors.

6.6.2 Manipulation of Non-Financial Goal Achievability

Table 14 (Panel A) shows participants' probability estimates for achieving the assigned non-financial goals for each of the two achievability conditions.[43] Participants in the "low" achievability condition believed the probability of attaining the goals was 51% compared to a mean probability of 67% in the "moderate" achievability condition. Parametric ($t = 3.15$, $p < .005$) and non-parametric procedures (K-W test, $\chi^2 = 6.27$, $p < .05$) show the means are significantly different. Panel B of Table 14 reports the probability ratings for the two achievability conditions by case ("weak" and "strong" causal-linkage SPMS). A comparison indicates the achievability condition means are significantly different within each of the "weak" and "strong" causal-linkage cases (respectively $t = 2.56$, $p < .05$; $t = 2.80$, $p < .01$). Non-parametric tests (K-W) yield qualitatively similar results (weak causal-linkages: $\chi^2 = 6.27$, $p < .05$; strong causal-linkages: $\chi^2 = 3.70$, $p < .05$). Further analysis of the Panel B results shows the probability means within each achievability condition do not significantly differ across the two cases (t-tests, Signed Rank tests and Sign tests).

An additional manipulation check measure is summarized in Panel C of Table 14. For each achievability condition, Panel C reports participants' estimate of whether they believed the non-financial goals could be achieved (yes/no) in each of the two cases. In the "weak" causal-linkage case, 38% of the "low" achievability condition participants did

[43] The probability estimate represents a single-item measure of participants' self-efficacy for non-financial goal achievement.

not believe the goals could be achieved compared to only 11% in the "moderate" achievability group. In the "strong" causal-linkage case 28% of participants in the "low" achievability condition did not believe the non-financial goals could be achieved while just 4% answered "no" in the "moderate" achievability group. The Pearson χ^2 test was used to determine the independence of the rows and columns for each case (Jobson 1992). The results are significant for both the weak and strong causal-linkage cases (respectively $\chi^2 = 5.36$ $p < .05$; $\chi^2 = 5.91$ $p < .05$) indicating an association existed between participants' belief in their ability to achieve the non-financial goals and the achievability condition. Based on the frequencies presented in Panel C, participants in the high achievability condition were more confident they could achieve the non-financial goals than their counterparts in the low achievability condition.

Although the non-financial goal achievability manipulation significantly affected participants' probability ratings in the expected direction, the magnitude of the between groups difference is smaller than anticipated. Panels A and B of Table 14 show participants in the "low" achievability condition rated the likelihood of achieving the non-financial goals considerably higher than the 15% estimate provided in the case.[44] Panel D of Table 14 shows the probability ranges participants assigned to performance goals described as having a low, moderate or high likelihood of achievement. Using these ranges to interpret the results in Panels A and B, participants in the "low" achievability condition considered the non-financial goals to be in the middle of the range for goals described as "moderately" achievable.[45] Participants in the "moderate" achievability

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[44] Employing parametric and non-parametric tests, each of the means for the low achievability group in Panels A and B of Table 14 is significantly ($p < .01$) greater than 15%.

[45] The ranges estimated separately by participants in each of the two achievability conditions do not differ qualitatively from the combined results reflected in Panel D of Table 14.

condition on average believed their goals were in the lower range of "highly" achievable goals. These results indicate participants in the low achievability condition were more optimistic than anticipated. This optimism may be related to the empirically well-established tendency of individuals to be over-confident about their own abilities (e.g. Brenner et al. 1996; Klayman et al. 1999).

As a final check on the effectiveness of the non-financial goal achievability manipulation a repeated measures ANOVA was conducted (Table 15).[46] The repeated measures model is used to test for significant interactions involving "achieve" and the other within and between Ss factors in study. The dependent variable is participants' estimated probability of achieving the non-financial goals. SPMS causal-linkage strength ("causal") is the within Ss factor and the four between Ss factors are those described in section 6.1. Results indicate "achieve" does not interact significantly with "causal" (within Ss results not shown in Table 15) and the between Ss results, summarized in Table 15, show "achieve" is the only significant factor ($F = 10.9$, $p < .005$).

Collectively, the results of the analysis indicate the achievability manipulation created significantly different beliefs in the achievability of the non-financial goals, unaffected by the other within and between Ss factors present in the design.

6.7 Descriptive Statistics for Dependent and Mediating Variables

Results for the dependent and mediating variables are summarized in Table 16. Details are separately presented for each case ("weak" and "strong" causal-linkage SPMS) and for each non-financial goal achievability condition (Panels A and B). Panel C

[46] An analysis of residuals reveals no violations of the ANOVA assumptions.

collapses the results across the non-financial goal achievability conditions. The "average" column in each Panel collapses results across the two cases.

The results in Panel C show, as predicted, average non-financial goal commitment is greater in the "strong" versus "weak" causal-linkage case (respectively means of 3.2 and .51). Also as expected, participants found the non-financial goals more attractive when SPMS causal-linkages were "strong" versus "weak" (means of 2.6 and .89 respectively). Financial goal commitment differs little across the two cases but participants' personal goal for revenue growth is 68% in the "strong" case versus 58% in the "weak." Consistent with predictions, financial goal self-efficacy is higher when the SPMS causal linkages are "strong" versus "weak." The results in each achievability condition (Panels A and B) closely resemble those described for Panel C.

A Comparison of the results collapsed across the two cases in Panels A and B of Table 16 ("average" column) reveals the means for non-financial and financial goal commitment are both higher in the "moderate" achievability condition. Personal goals however are nearly the same in both conditions as is participants' self-efficacy for financial goal achievement. These trends are replicated within each case ("weak" and "strong" causal-linkages).

Table 17 presents the total correlation matrix for the independent, dependent and mediating variables.[47] The correlations provide an overview of the relationships that exist among the variables. As expected SPMS causal-linkage strength is significantly associated ($p < .01$) with both non-financial commitment and non-financial goal attractiveness (mediating variable). Causal-linkage strength is also significantly

[47] The independent variables are dummy coded for purposes of calculating the correlations presented in Table 17.

correlated ($p < .01$) with both financial goal self-efficacy (mediating variable) and participants' personal goals. Non-financial goal achievability correlates significantly ($p < .01$) with non-financial goal self-efficacy (participants' probability estimate for achieving the non-financial goals) and financial goal commitment. Also, non-financial goal self-efficacy is significantly associated ($p < .01$) with financial goal self- efficacy (mediating variable), personal goals and financial goal commitment.

Several of the expected relationships between the mediating and dependent variables are also supported by the results reported in Table 17. Non-financial goal attractiveness is significantly associated ($p < .01$) with non-financial goal commitment. Significant correlations ($p < .01$) also exist between financial goal self-efficacy and both financial goal commitment and personal financial goals. Consistent with predictions, Table 17 also shows significant associations among non-financial goal commitment, financial goal commitment and personal goals. Details of the Table 17 correlations are evaluated in the hypotheses tests to follow.

6.8 Hypotheses Tests

6.8.1 Evaluation of Order, Version and Company Effects

The analysis reported in the preceding sections indicates between group differences exist for "order", "version" and "company" on one or more measures collected in the study. Given these differences a two-step approach was used to assess their potential impact on the dependent variables. First, a repeated measures MANOVA was conducted using non-financial goal commitment, financial goal commitment and personal goals as the set of dependent variables. The multivariate approach is appropriate given the significant correlations among the dependent variables shown in Table 17. The

within Ss factor in the model is "causal" (strength of SPMS causal linkages) and the between Ss factors are "achieve", "order", "version" and "company" (see 6.1 for descriptions of each). To conserve degrees of freedom the model is limited to main effects and 2-way interactions involving "causal" or "achieve" and the remaining between Ss factors. Table 18 (Panels A and B) shows the only significant factor, other than the predicted main effects for "causal" and "achieve" (respectively, $F=13.72$, $p < .001$; $F=3.08$, $p < .05$), is a main effect for "order" ($F=4.54$, $p < .01$). None of the between Ss factors interact with "causal" or "achieve".

The second step also employed a multivariate repeated measures analysis but instead of including all between Ss factors in the same model, separate models were run for each of the following three between Ss factors: "order, "version" and "company". Each model included the independent variables ("causal" and "achieve") along with one of the three between Ss factors identified above. By increasing the degrees of freedom this step provides a more powerful test of "order", "version" and "company" effects. To further conserve degrees of freedom, only main effects and 2-way interactions involving "causal" or "achieve" and the third factor were examined. The results are qualitatively similar to those reported in Table 18. The only significant factor other than "causal" and "achieve" is the "order" main effect ($F=5.38$, $p < .005$). No other multivariate main or interaction effects are significant.[48]

Based on the results of the two-step analysis, the between Ss effects of "order" will be evaluated during hypotheses testing. Models with and without "order" as an

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[48] A review of the univariate results indicates "Company" is the only significant between Ss factor (other than "Achieve" and "Order") using Personal Goals as the dependent variable ($F=5.33$, $p < .05$). This result is of little consequence however since neither the univariate between Ss factor "Achieve" or its interaction with "Company" are significant for Personal Goals (respectively $F=.09$, $p=.76$; $F=.32$, $p=.57$).

additional between Ss factor will be run. "Order" will only be retained in a model if it reduces the significance level of either "causal" or "achieve".

6.8.2 Sensitivity Analysis of Models used for Hypothesis Testing

Order Effects. The models used to test hypotheses 1-4 for financial goal commitment, personal goals and non-financial goal commitment are summarized, respectively in Panels A, B and C of Table 19. Each model has one within Ss factor, "causal" and one between Ss factor, "achieve". Additional models (not reported in Table 19) including "order" as a between Ss factor were also run for each dependent variable. The models including "order" produced significance levels for "causal", "achieve" and their interaction qualitatively similar to the Table 19 results. In each model, the 2-way interactions involving "order" ("order" x "causal"; "order" x "achieve") are non-significant. Because the inclusion of "order" does not influence significance levels for the effects of interest, it is excluded from the Table 19 models.

Ability Effects. The effect of including managerial ability as a covariate in each of the Table 19 models was also analyzed.[49] Separate models were run using the two different measures of ability discussed in Section 6.3 as a covariate. Inclusion of ability as a covariate has no impact on significance levels for the main or interactive effects of "causal" and "achieve".[50] Because neither measure influences the results, "ability" is excluded from the Table 19 models. The non-significance of ability as a covariate is

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[49] The ability measures were not collected before administration of the treatment variable because of the possibility that doing so might influence responses on the dependent measures. When there is little risk that the independent variable manipulation will affect the covariate it is acceptable to collect the measure after the treatment is introduced (Neter, Wasserman and Kutner 1985).

[50] Repeated measures regression models (Coehn and Coehn 1983; Darlington 1990) were also run including each of the Table 10 (Panel A) controlled variables as a control variable (separate model for each covariate). The resultant significance levels for "causal", "achieve" and their interaction do not differ qualitatively from those reported in Table 19.

likely due to two reasons. First, parametric (t-tests) and non-parametric (K-W and median tests) comparisons of ability levels across the two achievability conditions show no significant differences. Second, neither measure of ability is significantly correlated with the dependent variables in the study. Glass and Hopkins (1996) suggest one or both of these conditions should exist when considering the appropriateness of a covariate.

Other Covariate Effects. Table 4 identifies three measures for consideration as covariates in the analysis. Because of the specialized nature of the case settings, background information was gathered on participants' familiarity and direct experience with e-commerce as well as their experience with a SPMS. Additional versions of the Table 19 models were run including each of the first two measures as covariates. Results for the revised models do not differ qualitatively from those reported in Table 19. A repeated measures regression model was run using the third measure as a categorical variable ("SPMS") coded 1 if the participant's company uses a SPMS similar to those described in the cases and 0 otherwise. Results for the model including "SPMS" as a covariate do not differ qualitatively from those reported in Table 19. Collectively this analysis indicates the results in Table 19 are not affected by participants' experience either with e-commerce settings or a SPMS.

Reward System Effects. Two steps were taken to evaluate the impact of the results discussed in section 6.5 regarding participants' understanding of reward system details. First, the Table 19 models were re-run excluding the observations discussed in section 6.5. Second, repeated measures regression models (Coehn and Coehn 1983; Darlington 1990) were constructed using participants' responses to the reward system measures as control variables. The results of both steps yield significance levels for "causal",

"achieve" and their interaction that do not differ qualitatively from those reported in Table 19 (Panels A, B and C). Consequently, for purposes of hypothesis testing, all observations are included in the models and the reward system measures are not included as control variables.

Completion Time Effects. Because the environment in which participants completed the materials was not observed a review was conducted of the time spent by each participant on the materials. Times considerably above the 70-minute average may be indicative of numerous interruptions or distractions, making it difficult for the participant to concentrate on the task. Times well below the average may indicate lack of attention or interest (or both). Two participants' total time was more than 2 standard deviations above the mean (356 and 200 minutes) while a third participant took just 23 minutes to complete the materials. Excluding these three observations from the analysis results in no qualitative differences to the significance levels reported in Table 19. Accordingly, the results reported below include all observations for which a complete set of responses was received.

Variable Transformation Effects. To check for violations of the repeated measures ANOVA assumptions, an analysis of residuals was performed on each of the Table 19 models. The residuals for the Panel B model appear normally distributed (K-S test, Q-Q plot review) and the variances do not differ significantly across groups (Box's test, Levene's test). However, the residuals for the Panel A and C models are not normally distributed and heterogeneity of variance is present for the Panel A model. A review of residuals diagnostics shows significant negative skewness is present for each of the three dependent variables included in Panels A and C. Stevens (1996) points out that the F test

is robust to departures from the assumptions of normality and homogeneity of variance (when cell sizes are similar). However, as a precaution a power transformation was performed on the dependent variables to satisfy the repeated measures ANOVA assumptions.[51]

The residuals for the revised models using transformed dependent variables are normally distributed (K-S tests, Q-Q plots) and the only assumption violation remaining is heterogeneous variances for the Panel A model residuals. Since the between Ss factor "achieve" has cell sizes that differ by only 2 participants, the effect on Type 1 error is minimal (Hatcher and Stepanski 1999; Stevens 1996). The significance levels for the models using transformed dependent variables do not differ qualitatively from those presented in Table 19 (Panels A and C).[52] Accordingly, the subsequent discussion of results is based on the Table 19 models using non-transformed measures of the dependent variables.

6.8.3 Strength of SPMS Causal Linkages

Hypotheses 1 and 2 predict financial goal commitment, personal goals for financial measures and non-financial goal commitment will be higher when SPMS causal linkages are "strong" rather than "weak" (Figure 4). The results in Table 19 Panel A show H1a is not supported (F=.37, p=.54) and a review of the descriptive results in Table 16, Panel C indicates why. The average financial goal commitment expressed by managers in the "weak" causal-linkage case is 3.4 compared to a mean of 3.3 in the

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[51] First a constant (6) was added to each response to eliminate negative values (Jobson 1992). Then, to remove the negative skewness the transformation $y = x^2$ was employed (Jobson 1992).

[52] Separate univariate repeated measures models were also run using the transformed dependent variables with "order", "version", "company" as between Ss factors and "ability" as a covariate to determine if the results differed from those reported for the non-transformed variables. No qualitative differences were found.

"strong" causal-linkage case. The results presented in Panels B and C of Table 19 support H1b and H2. Managers in the "strong" causal-linkage case indicated they would set a financial goal of increasing revenues by 68% compared to a goal of 58% in the "weak" causal-linkage case ($F=12.86$, $p < .005$). Managers were also significantly more committed to the non-financial goals in the "strong" versus weak causal-linkage case. The average non-financial goal commitment in the "strong" causal-linkage case is 3.2 compared to .5 in the weak causal-linkage case ($F=43.92$, $p < .001$).

Financial goal self-efficacy is predicted to mediate the effects of SPMS causal linkage strength on financial goal commitment and personal goals for financial measures. Non-financial goal attractiveness is predicted to mediate the effects of causal linkage strength on non-financial goal commitment. The mediation effects are formally tested in H6 and H7 but a review of the Table 16 (Panel C) indicates the relationship between causal linkage strength and each of the mediating variables is consistent with expectations. Managers' self-efficacy for achieving financial goals (Table 16, Panel C, item 5) is significantly greater in the "strong" versus "weak" causal-linkage SPMS case ($t=5.39$, $p < .001$).[53] Also as expected, managers found the non-financial goals significantly more attractive in the "strong" versus "weak" causal-linkage case ($t=3.70$, $p < .005$).[54] Non-parametric procedures yield similar results for both comparisons (Signed ranks test). Collectively the results indicate SPMS causal linkage

[53] Because of the high correlation between the two measures of financial goal self-efficacy, the results reported here and for subsequent analysis refer to measure "1". Unless otherwise noted the results using measure "2" are qualitatively similar to those reported for measure "1".

[54] A repeated measures ANOVA was run for each mediating variable with "causal" as the within Ss factor and "achieve" the between Ss factor. The significance level for "causal" is significant for financial goal self-efficacy ($F=14.28$, $p < .001$) and non-financial goal attractiveness ($F=13.32$, $p < .005$). Neither the "achieve" main effect nor the "achieve" x "causal" interaction is significant.

strength had the predicted effects on both mediating variables and two of the three dependent variables.

6.8.4 Non-Financial Goal Achievability

Hypotheses 3 and 4 predict a positive relation between the achievability of SPMS non-financial goals and financial goal commitment, personal goals for financial measures and non-financial goal commitment (Figure 4). Results in Table 19 (Panel A) indicate H3a is supported. On average managers in the "moderate" achievability SPMS condition were significantly more committed to the assigned financial goals than managers in the "low" achievability condition ($F=6.67$, $p < .05$). A review of Table 16, Panels B and A shows managers' average commitment to the financial goals in the "moderate" achievability condition was 3.9 compared to 2.9 in the "low" achievability condition. Panels B and C of Table 19 indicate neither H3b nor H4 are supported. Managers in the two non-financial goal achievability conditions did not differ significantly either on the financial goals they would set or their commitment to the non-financial goals.

Results in Table 14 (Panel A) indicate managers' probability estimate of achieving the non-financial goals (NFGSE) in the "low" achievability condition was 51% versus 67% in the "moderate" achievability condition. While this difference is smaller than expected it is significant ($p < .01$) and the results reported in Table 17 show significant positive correlations between NFGSE and both financial goal commitment and personal goals ($p < .01$). Because these correlations are consistent with the theoretical framework developed in Chapter 4, additional analysis was performed using NFGSE as the independent variable and financial goal commitment, personal goals and non-financial goal commitment as the dependent variables in three separate regression

models. This approach offers the advantage of examining the impact of managers' specific beliefs about the achievability of non-financial goals on the dependent variables.

Consistent with the regression approach recommended by Coehn and Coehn (1983) and Darlington (1990) when investigating between Ss effects in a repeated measures design, total values for the independent and dependent variables are calculated by summing the individual scores for each case. The resultant values for the dependent variables are then regressed on the values for the independent variable(s). Results of the regression models are presented in Table 20. To isolate the effects of non-financial goal self-efficacy (NFGSE) on the dependent variables, "ACHIEVE" is included in each model as a control variable.[55] The regression coefficients for NFGSE are positive and significant for both financial goal commitment (Panel A) and personal goals (Panel B) (respectively $t=3.54$, $p < .01$; $t=3.08$, $p < .01$). These results provide further support for H3a and also demonstrate support for H3b. Managers' specific beliefs about the achievability of non-financial goals had a significant influence on both their commitment to financial goals and the difficulty of the personal goals they were willing to set. The results of Panel C do not support H4; NFGSE does not have a significant effect on managers' commitment to non-financial goals ($t = .72$, $p > .20$).

Financial goal self-efficacy (FGSE) is predicted to mediate the effects of NFGSE beliefs on financial goal commitment and personal goals. Mediation effects will be formally tested in H6 but a review of Table 16 (Panels A and B, "average" column) indicates managers' FGSE did not differ between the two non-financial goal achievability conditions ($t = .04$, $p > .90$). However, results reported in Table 17 show NFGSE and

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[55] Excluding ACHIEVE from the models in Table 20 results in coefficient values and t-statistics for NFGSE that do not differ qualitatively from those reported in Panels A, B, C and D.

FGSE are significantly correlated ($p < .01$). To test the impact of specific NFGSE beliefs on FGSE, a regression model was developed consistent with the method described in the preceding paragraph. FGSE is the dependent variable and NFGSE is the independent variable. As a precaution, "ACHIEVE" is included in the model as an additional independent variable to isolate the effects of NFGSE beliefs on FGSE. Consistent with the Chapter 4 framework, Table 20, (Panel D) shows NFGSE has a significant impact on managers' FGSE beliefs ($t=2.04$, $p< .05$). The links between the achievability manipulation, non-financial goal efficacy beliefs, financial goal self-efficacy and the dependent variables will be analyzed as part of the tests for H6.

6.8.5 Correlations Among the Dependent Variables

Significant positive correlations are predicted between non-financial goal commitment and both financial goal commitment (H5a) and managers' personal goals for financial measures (H5b). The correlations arise because of the similar effects causal-linkage strength and non-financial goal achievability are predicted to have on each of the dependent variables. To test H5a and H5b several correlation matrices were constructed. The first matrix is summarized in Table 17 and supports both hypotheses. The correlations between non-financial goal commitment and, respectively, financial goal commitment and personal goals are .24 ($p < .05$) and .33 ($p < .01$).

Because the observations in Table 17 are based on participants' responses to both cases the non-independence could inflate correlations among the dependent variables. Therefore another correlation matrix was constructed based on participants' responses averaged across the two cases and achievability conditions (Table 16, Panel C, "average" column). Table 21 (Panel A) reveals the resultant correlation between non-financial goal

commitment and financial goal commitment is .47 ($p < .001$) supporting H5a. However H5b is not supported; the correlation between non-financial goal commitment and personal goals is -.01 ($p = .94$). A review of Table 16 suggests the lack of association may be due to the low variance of managers' personal goals across conditions. Managers' average personal goals did not differ across the two achievability conditions and the causal linkage manipulation only resulted in an 18% change. Conversely, the achievability manipulation resulted in a change of over 34% in both non-financial goal commitment and financial goal commitment. Further, non-financial goal commitment differed by over 500% between the two cases (.52 versus 3.2).

As a final step, correlation matrices were prepared for each of the four experimental conditions ("weak" and "strong" causal-linkages case; "low" and "moderate" non-financial goal achievability) represented in Table 16. The results (Table 21, Panels B-D) show significant correlations exist between non-financial goal commitment and financial goal commitment in the "strong" causal-linkage case and the "moderate" achievability condition (respectively .74, $p < .001$; .53, $p < .005$). The non-significant correlations in the "weak" causal-linkage case and "low" achievability condition are likely attributable to the high variance in non-financial goal commitment relative to financial goal commitment and personal goals in those conditions (Table 16). Although on average managers responded as expected in the two cells, there was considerable variance in their commitment to the non-financial goals. Results in Panels B-D of Table 21 show no support for H5b. Overall, the analysis in Tables 17 and 21 provide partial support for H5a and limited support for H5b.

6.8.6 Mediation Hypotheses

The mediation hypotheses are tested using Baron and Kenny's (1986) three-step regression approach. First, the dependent variable is regressed on the independent variable. Second, the proposed mediating variable is regressed on the independent variable. Third, the dependent variable is regressed on the independent and mediating variables in the same model. Assuming a significant relationship exists in the first equation, mediation exists when: (1) the independent variable significantly influences the mediating variable (Step 2); and (2) the mediating variable significantly influences the dependent variable in Step 3. The latter two conditions are further qualified by requiring the influence to be in the predicted direction. Mediation effects lie on a continuum ranging from none to complete (Baron and Kenny 1986). Complete mediation exists when the independent variable, significant in Step 1, becomes non-significant when the mediating variable is included and is significant in Step 3. Partial mediation exists when both the independent and mediating variables are significant in Step 3. No mediation exists when the mediating variable is non-significant in Step 3 and the independent variable remains significant. The regression models used to test for mediation effects also facilitate development of path models examining the direct and indirect relationships between independent and dependent variables in the presence of mediating variables (Darlington 1990; Wonnacott and Wonnacott 1981). Consequently, the results of the path analytic models for each mediation relationship are also presented and discussed.

Hypotheses 6a and 6b predict financial goal self-efficacy (FGSE) will mediate the relationships between causal-linkage strength (CLS) and, respectively, financial goal commitment (FGC) and personal goals (PG) (Figure 4). H6a is not tested because the

impact of CLS and FGC is non-significant (Table 19, Panel A); there is no effect for FGSE to mediate (Baron and Kenny 1986).[56] The three regression models used to test H6b are summarized in Table 22, Panel A. The results indicate FGSE completely mediates the relationship between CLS and PG. CLS is significant in the predicted direction in models 1 and 2 (Table 22, Panel A) and becomes non-significant when FGSE is included in Model 3. The results of Table 22, Panel A are summarized in the path model shown in Figure 10, Panel A. Path analysis allows decomposition of an independent variable's total effect on a dependent variable into direct and indirect effects (Cloyd and Spilker 1999).[57] The path model coefficients reflect the complete mediating effects of FGSE. Figure 10, (Panel A) shows the total effect (.29) of CLS on PG consists entirely of indirect effects (.31) through FGSE (.41 x .75); direct effects are non-significant ($t = -.28$, $p > .20$).

Table 22, Panel B summarizes the regression models used to test H6c (Figure 4). The results indicate non-financial goal attractiveness (NFGA) partially mediates the relationship between CLS and non-financial goal commitment (NFGC). CLS significantly affects both NFGC and NFGA in the predicted directions (Models 1 and 2). However, CLS remains significant ($t = 4.91$, $p < .001$) when combined with NFGA ($t = 4.50$, $p < .001$) in Model 3. According to Baron and Kenny's (1986) framework this result indicates partial mediation. The path analysis in Figure 10, Panel B, reflects the nature of

[56] A model was run regressing FGC on CLS and FGSE (not shown in Table 22). The coefficient for CLS is non-significant but the coefficient for FGSE is ($t = 3.08$, $p < .01$).

[57] The standardized regression coefficients in Model 1 (Table 22, Panel A) represent the independent variable's total effect. Total effects are made up of direct (Model 3) and indirect effects (Models 2 and 3). Indirect effects are calculated by multiplying the standardized regression coefficients for the paths connecting the independent variable to the dependent variable through the mediating variable (Wonnacott and Wonnacott 1981).

the partial mediation. Nearly 71% of the CLS total effect (.51) consists of a significant direct effect (.36) but 29% is attributable to indirect effects through NFGA (.29 x .51).

To test for the mediation effects predicted by H7a (Figure 4) a two-stage process was employed. The variables included in the first stage model were non-financial goal achievability (ACHIEVE), FGSE and financial goal commitment (FGC). The results of the model do not support H7a; ACHIEVE has a non-significant effect on FGSE ($p = .97$). The regression models used in the second step are presented in Table 23, Panel A. Based on the results of the analysis presented in Table 20 (Panel A), NFGSE is included as an additional variable in the mediation analysis. The results reported in Panel A (Table 23) indicate NFGSE, not FGSE, completely mediates the relationship between ACHIEVE and FGC. Respectively, Models 1 and 2 show ACHIEVE significantly affects both FGC and NFGSE. When NFGSE and ACHIEVE are included in Model 4 with FGSE, only NFGSE is significant ($t=2.99$, $p < .01$). The path diagram summarizing the four regression models is shown in Figure 11, Panel A. Over 54% of the ACHIEVE total effect on FGC (.34) is explained by the indirect effects (.18) through NFGSE (.45 x .41). The path model also shows NFGSE has a significant direct effect (.32) on FGSE ($t=2.13$, $p < .05$). Although FGSE has a positive impact on FGC (.19), it is non-significant ($t=1.59$, $p = .12$) and does not mediate the relationship between NFGSE and FGC. Overall, the additional mediation analysis does not support H7a.[58]

Tests of H3b indicate ACHIEVE has no direct effect on Personal Goals (PG) but additional analysis reported in Table 20 (Panel B) shows NFGSE does. Therefore, to test H7b (Figure 4) the models reported in Table 23 (Panel B) include NFGSE. The results in

[58] The only change to the regression models resulting from the use of financial goal self-efficacy measure "2" instead of "1" is the t-statistic for FGSE in Model 4 increases to 1.79 and the p-value improves to .08.

Panel B reveal FGSE partially mediates the relationship between NFGSE and PG. NFGSE has a significant total effect (.43) on PG (Model 1, $t=3.08$, $p < .01$) and FGSE (Model 3, $t=2.04$, $p < .05$). When NFGSE and FGSE are included in the same model both have a significant influence on PG (Model 4). These results support a conclusion of partial mediation. Figure 11 (Panel B) summarizes the path coefficients produced by the regression models. Over 81% of the total effect (.43) of NFGSE on PG is direct (.35) but 19% is indirect through FGSE (.30 x .28). As reported above, ACHIEVE has no significant direct effects on either FGSE or PG. Overall, the results of the regression and path analysis support the role of FGSE as partially mediating the relationship between NFGSE and PG.

6.9 Research Questions

Results of tests for the interactive effects of SPMS causal-linkage strength and non-financial goal achievability are reported in Table 19, Panels A-C. The findings indicate none of the interactions are significant supporting a negative response to the research questions posed in Chapter 4. The mean responses for the within and between Ss conditions are plotted in Figure 9, Panels A-C. The graph for each dependent variable shows an almost complete lack of interaction between the two independent variables. The effect of SPMS causal-linkage strength on personal goals and non-financial goal commitment is consistent across the non-financial goal achievability conditions. Similarly, the effect of non-financial goal achievability on financial goal commitment does not differ across the two causal-linkage strength conditions.

6.10 Supplementary Analysis

The results in Table 20 indicate non-financial goal self-efficacy (NFGSE) affects financial goal commitment and personal goals but not non-financial goal commitment (NFGC). This result is inconsistent with the framework developed in Chapters 3 and 4 and bears further investigation. As discussed in Chapter 3, two antecedents exist to goal commitment decisions: self-efficacy and goal attractiveness. In this study, it is possible that NFGSE did not affect NFGC decisions because non-financial goal attractiveness (NFGATT) considerations were weighted more heavily by participants. To evaluate this possibility separate regression models were prepared for each case ("weak" and "strong" causal-linkages) and for the results collapsed across the two cases with NFGC as the dependent variable and NFGSE and NFGATT the independent variables. A comparison of the standardized regression coefficients in each model will provide evidence about the relative influence of each factor on managers' NFGC decisions.

The model for the combined cases is presented in Table 24 (Panel A) and the separate models for the "weak" and "strong" causal-linkage cases are presented, respectively, in Panels B and C. Panel A shows only NFGATT has a significant effect on NFGC for the results collapsed across the two cases ($t = 4.83$, $p < .001$). Consistent with the results of Table 20 (Panel C), the coefficient for NFGSE is non-significant. For the "weak" causal-linkage case (Panel B) NFGATT has a significant influence on NFGC ($t = 5.91$, $p < .001$) while NFGSE does not ($t = -.28$, $p = .78$). The standardized regression coefficient for NFGATT is .64 compared to -.03 for NFGSE. A different pattern emerges in the "strong" causal-linkage case (Panel C): NFGATT again has a significant effect on NFGC ($t = 2.70$, $p < .01$) but NFGSE does as well ($t = 2.32$, $p < .05$). A comparison of

standardized beta coefficients reveals that even in the strong causal-linkage case, NFGATT (.33) explains more variation in NFGC than NFGSE (.29).

The preceding analysis indicates the attractiveness of the SPMS non-financial goals influenced whether or not the achievability of those goals affected managers' goal commitment decisions. In the "weak" causal-linkage case managers' rating of the non-financial goal attractiveness was only .9 (Table 16, Panel C) and NFGSE did not influence goal commitment. Conversely, as shown in Table 16 (Panel C), in the strong causal-linkage case, managers' rated the attractiveness of the non-financial goals nearly three times higher (mean = 2.6) and NFGSE had a significant impact on goal commitment. These results suggest that only when the attractiveness of the non-financial goals reaches a certain threshold (strong causal-linkage case) does the achievability of the non-financial goals affect managers' non-financial goal commitment decisions. Interactions between goal attractiveness and achievability have not been examined in prior goal commitment research but the findings documented in this study suggest further work is warranted.

Contrary to predictions financial goal commitment was unaffected by the causal-linkage strength manipulation. However, the results suggest that the attractiveness of the assigned financial goals may have been so high that managers were willing to commit to them regardless of the SPMS causal-linkage content. Table 10, Panel A (item 2) shows managers rated financial goal attractiveness highly in both cases: means of 2.69 and 2.98 respectively for the "weak" and "strong" causal-linkage cases (upper limit = 5). To examine the impact of these ratings a within Ss repeated measures regression model was developed using the two antecedents of financial goal commitment decisions as

predictors: financial goal self-efficacy (FGSE) and financial goal attractiveness (FGA). The coefficient for FGA is positive, and approaches significance at conventional levels ($t = 1.92$, $p = .06$) but the coefficient for FGSE is not significant.[59] This suggests that when assigned financial goals are made highly attractive through the reward system, managers general level of commitment may be unaffected by the SPMS content. However, since personal goals may represent a more precise measure of intended performance (Chapter 3) the results in Table 19 (Panel B) indicate SPMS causal-linkage strength will have a significant impact on goal setting.

6.11 Results Discussion

Figure 4 identifies the key hypotheses developed in this study, which collectively represent seven predictions. The results summary presented in Table 25 shows six of these seven predictions were fully or partially supported. Table 25 also indicates three of the five mediation hypotheses were supported. Extensive sensitivity analyses were conducted and demonstrate these results are not influenced by the order, version and company factors present in the research design. Similarly, the results are unaffected by factors such as ability, e-commerce familiarity and experience, or prior use of a SPMS. Manipulation checks indicate the independent variable manipulations were salient and had the predicted effects on participants' behavior. The analysis of controlled variables shows participants believed the two cases were equivalent with respect to key measures of financial goal difficulty and attractiveness, and non-financial goal difficulty and controllability. Collectively these findings provide substantial evidence of internal

[59] A within Ss regression model was also run using "Personal Goals" as the dependent variable and FGSE and FGA as predictors. Both FGSE ($t=7.98$, $p < .001$) and FGA are significant ($t=2.85$, $p < .01$).

validity, supporting the conclusion that the results are attributable to the effects of the independent variables.

Results indicate the strength of SPMS causal-linkages significantly affected managers' personal goals for financial performance (H1b) and their commitment to non-financial goals (H2). The stronger the causal-linkages contained in the SPMS, the more difficult the personal goals and the greater managers' commitment to the non-financial goals. As noted in Chapter 2, proponents of the SPMS approach claim one of its major strengths is the specification of key cause-effect relationships that drive success in the organization. This study shows that a failure to carefully identify and articulate the causal-linkages among performance objectives and measures can have a negative impact on managers' willingness to commit to the multiple SPMS performance goals. The analysis also shows, as predicted, financial goal self-efficacy (fully) and non-financial goal attractiveness (partially) mediated the effects of causal-linkage strength on personal goals (H6b) and non-financial goal commitment (H6c) respectively. Consistent with the theoretical framework developed in Chapter 4, these results show that by identifying the key non-financial drivers of financial success, a SPMS can raise managers' beliefs in their ability to achieve difficult financial performance goals. Strong causal-linkage content also leads to an increase in the attractiveness of the non-financial goals. The findings also show that in a goal hierarchy such as a SPMS, managers find the secondary goals (non-financial) more attractive when they believe those goals are strongly linked to achievement of the primary (financial) goal.

As predicted, the achievability of non-financial goals significantly impacted managers' commitment to the assigned financial goals (H3a). This result was obtained

despite the fact that managers in the "low" achievability condition were considerably more optimistic about their chances of attaining the non-financial goals than suggested by the content of the case materials. Consequently, conditions within an organization (resource constraints, control, etc.) that reduce managers' beliefs in the achievability of non-financial goals to levels below those documented in this study would reduce financial goal commitment even further. Additional analysis reported in Table 20 reveals managers' specific self-efficacy ratings for non-financial goal achievement had a significant influence on their commitment to the financial goals (H3a) and the difficulty of their personal goals (H3b). In addition, non-financial goal self-efficacy had a significant influence on non-financial goal commitment (H4), but only in the strong causal-linkage case where the attractiveness of the goals was relatively high (Table 24). The pattern of these results demonstrate that in a hierarchical goal setting such as a SPMS, if managers believe there is a low likelihood of achieving non-financial goals, a serious consequence may be low levels of commitment to the financial goals. As expected, managers' beliefs in their ability to achieve the non-financial goals affected their beliefs in their ability to achieve the financial goals (Table 20). Further analysis shows, as predicted, financial goal self-efficacy partially mediated the effects of non-financial goal self-efficacy on personal goals (H7b). The mediation effects demonstrate *how* managers' personal goals for financial performance are affected by their beliefs in the achievability of the non-financial goals.

Partial support was found for the predicted association between financial and non-financial goal commitment. Across all conditions (Table 21, Panel A) the two variables are significantly correlated. However, the significance of the association is dependent on

the experimental condition. Specifically, the correlations are only significant in the "strong" causal-linkage" case and the "moderate" achievability condition.

CHAPTER 7

CONCLUSIONS

7.1 Discussion and Contributions

Companies are increasingly using a SPMS to clarify strategy, build commitment, focus effort on key success factors and drive performance improvements. Developing a SPMS is not a trivial exercise. Considerable effort and resources are required to implement, maintain and improve the system. Despite the growing use of the SPMS approach, accounting research has only begun to examine the consequences. In particular, few studies have focused on the link between SPMS use and managerial actions and decisions. This represents a significant gap in knowledge and this study is among the first to examine the behavioral implications of the SPMS approach.

This study focused on the central role of multiple, difficult non-financial and financial performance goals in a SPMS. The theoretical framework presented in Chapter 3 shows goal commitment significantly moderates the goal difficulty – performance relationship. The implication of the research reviewed in Chapter 3 is that without sufficient levels of goal commitment, the use of difficult SPMS performance goals is unlikely to result in performance gains for an organization. Although accounting researchers have been interested in the role of performance goals in organizations for many years, this is the first study to examine the issue in the SPMS context and one of the few to focus specifically on goal commitment.

An extensive literature review and a series of field interviews revealed two key SPMS features expected to influence goal commitment decisions: the causal linkages among non-financial and financial objectives and measures; and the achievability of the

SPMS non-financial goals. A thoroughly pre-tested experiment was electronically administered to a group of participants with extensive managerial experience. The use of experienced participants permits generalization of the theory to the type of managers who are likely to be responsible for achieving SPMS performance goals. As reflected in Table 25, the majority of the study's key hypotheses were fully or partially supported. The results were obtained even though managers were not permitted to participate in setting their own goals and prior research shows participation can positively affect goal commitment decisions.

The study makes several contributions to both the accounting literature and the psychology-based goal-setting literature. At a broad level this study contributes to the accounting literature in two ways. First it identifies and demonstrates how key characteristics of a recent management accounting innovation, a SPMS, affect the behavior of experienced managers. To date there has been a paucity of SPMS research with a behavioral focus. Second, it extends the extensive goal setting literature in accounting by examining goal commitment decisions in a multi-goal setting. Previous accounting research has focused almost exclusively on single-goal settings. Following are the specific contributions to the accounting literature:

1. Prior accounting research has examined the impact of budgetary participation and other accounting control system features on managers' behavior. However, this is the first study to demonstrate that the strength of the SPMS causal-linkages can positively impact goal commitment. This contributes to the accounting literature by showing that the content of a performance measurement system can affect managerial commitment to both the non-financial and financial goals. The implication is that care must be taken when developing the SPMS causal-linkage content; selecting a loosely coupled set of performance objectives and measures may have negative implications for goal commitment.

2. Prior accounting research has focused almost exclusively on single-goal settings. This is the first study to examine how beliefs about secondary goal achievability can influence commitment to a primary goal. The results show that managers' beliefs in the achievability of non-financial SPMS goals affect their commitment to causally linked financial goals. These findings contribute to the accounting literature by indicating the importance of properly calibrating the achievability levels of SPMS financial and non-financial goals. Prior accounting research has addressed the issue of budget achievability but not in goal hierarchies such as a SPMS. Setting non-financial goals that are perceived as unachievable for any reason (e.g. lack of resources, insufficient time, etc.) may have negative effects on managers' willingness to commit to SPMS financial performance goals.

3. Finally, this is the first study to establish the role of self-efficacy and goal attractiveness as mediators of the effects of SPMS causal-linkage strength and non-financial goal achievability on goal commitment. A few accounting studies have attempted to develop an understanding of the antecedents of goal commitment but rarely in applied settings such as that of a SPMS. This study provides a rich understanding of why the two SPMS features affect goal commitment decisions. The mediation findings contribute to the accounting literature by demonstrating that actions taken within the organization to bolster efficacy beliefs (e.g. clear specification of cause-effect relationships, provision of task-relevant information) or goal attractiveness (e.g. rewards) can foster goal commitment in a SPMS setting.

The contributions to the broader goal-setting literature are as follows:

1. This study identifies a new source of task relevant information (SPMS causal-linkage strength) that can affect self-efficacy, goal attractiveness and goal commitment. No previous goal setting studies have examined how the content of a performance measurement system can influence goal setting behavior.

2. This study is among the first to examine goal commitment decisions in a hierarchical goal setting. Hierarchical goal settings are beginning to receive attention in the literature but to date few studies have focused on this area. No known goal-setting studies have shown that beliefs in the ability of a secondary goal can affect primary goal efficacy beliefs and goal commitment.

7.2 Limitations

The limitations of the experimental design employed in this study fall into three categories: nature of the task; nature of the case-settings; and incentives. The task limitation results from the design choice to have participants assume a role in a hypothetical setting as opposed to performing an actual task. The scenario approach afforded considerable flexibility in designing the experiment and the use of "real" managers allowed participants to draw on their relevant professional experience in completing the requirements. However, managers' commitment decisions were based on how they would react if faced with a similar situation in the workplace. Whether their commitment decisions would be the same in an actual setting with similarities to the scenarios is an empirical question.

The second limitation relates to the specialized electronic commerce setting employed in each case. Demographic information collected from participants indicates few had extensive experience in this area. As a result, participants' ability to respond meaningfully to the requirements may have been limited. However, sensitivity analysis reported in Chapter 6 indicates differences in participants' e-commerce experience did not significantly affect their responses to the key measures (dependent variables, manipulation checks). Further, both cases involved an e-commerce product to avoid the potential confound of participants being more familiar with one setting versus the other.

The final limitation results from the absence of actual incentives influencing managers' decisions to commit or not commit to the assigned goals. No specific predictions were made about incentive effects but the scenarios did require participants to relate to a reward system where certain types of goals were directly rewarded and others

were not. Whether managers' commitment decisions would be the same in a setting where actual incentives exist for achieving the goals is unclear. However, it seems plausible that the lack of incentives (disincentives) to commit (not commit) would bias against finding significant results by restricting the range of goal commitment (personal goal) responses.

7.3 Future Directions

SPMS research is an emerging field and considerable opportunities exist to further our understanding of various facets of the approach. A few examples follow. Research could yield useful insights into the means by which management constructs the causal-model of the firm represented by the SPMS. This study examined the consequences of a well-developed set of causal-linkages but a fundamental issue is how such a model is built. Is it an intuitive process whereby a SPMS simply formalizes what managers already know to be the drivers of performance? Or is it a learning process requiring managers to first identify the cause-effect relationships and then articulate them in the form of SPMS objectives and measures? Is the causal-model sensitive to changes in the operating environment? What constraints (e.g. data availability, collection costs, etc.) affect the objectives and measures included in the system?

This study examined goal commitment decisions immediately after the goal was initially assigned. However, the achievement of difficult performance goals requires a sustained effort over an extended period of time. Consequently, an area for further research is managers' willingness to maintain their commitment to the multiple SPMS performance goals over time. How does performance on a leading indicator (e.g. customer satisfaction) affect a manager's on-going commitment to the related lag

indicator (e.g. revenue growth)? As managers observe the validity of the SPMS cause-effect relationships over time, does this affect their commitment the non-financial and financial performance goals? Given multiple performance goals, how do managers allocate their commitment over time?

Finally, many of the cause-effect relationships contained in a SPMS may require trade-offs or involve conflicts. For example, customer satisfaction can be improved in the hopes of generating revenue growth and improved profits, but not without costs. Similarly product development time can be shortened but quality, customer satisfaction and future profits may be compromised in the process. A fruitful area of inquiry would be to examine how these trade-offs are managed both in terms of setting targets for conflicting measures and evaluating the resultant performance. Are the long-term financial effects of actions taken to achieve short-term non-financial goals understood by managers and their superiors? Are the trade-offs considered in the SPMS design? If they are considered, how is a balance achieved?

7.4 Summary

Research focused on developing a better understanding of the consequences of SPMS use is just beginning. This study represents one of the first attempts to examine the impact of the SPMS approach on the managers it is designed to benefit. There is much more to be learned about this increasingly popular management tool.

Table 1: Interview Questions Used in Preliminary Field Investigations of SPMS Characteristics and Consequences

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An increasing number of firms are using performance management and measurement systems similar to EPCOR's "ApfR" ("Aligning Performance for Results") to focus their employees on the actions that will lead to achievement of the strategic goals of the organization. The objective of this study is to develop a better understanding of the consequences of using such a system. ***You are assured that your responses will be kept confidential and the study will not identify responses with any individual.*** You are not required to respond to any question you do not wish to and you may end the interview at any time. Thanks for your participation!

Senior Management

(A) Adoption rationale and evolution of the ApfR:

1. Why was the ApfR adopted?
2. How did EPCOR first learn of the ApfR approach?
3. What is different about the ApfR compared to the system it replaced/modified?
4. What were the expected benefits and problems?
5. What benefits have been realized as the result of using the ApfR? Negative consequences?
6. Was there any resistance to implementing the ApfR? By whom? Why?

(B) Role of ApfR in supporting EPCOR's strategic goals:

7. How is the ApfR linked to EPCOR'S strategy?
8. How difficult are the ApfR performance goals?
9. Are financial goals for the organization more difficult than they were prior to use of the ApfR?
10. Is the ApfR used in evaluating performance? How?
11. In evaluating performance, how important is attainment of ApfR performance goals?

(C) Impact of ApfR on behavior:

12. Has the ApfR improved awareness of EPCOR'S strategic goals? How? For whom?
13. Has the ApfR created a better understanding of the key drivers of financial performance? For whom?
14. Has the ApfR impacted decision-making in the organization? How? For whom?
15. Has use of the ApfR led to a change in managerial responsibilities? How?
16. How controllable are the factors that affect outcomes on performance measures?
17. Has use of the ApfR affected managerial commitment to achieving corporate goals? How?

Table 1 continued: Interview Questions Used in Preliminary Field Investigations of SPMS Characteristics and Consequences

Operational-Level Managers

(A) Evolution and general consequences of the ApfR:

1. What is different about the ApfR compared to the system it replaced/modified?
2. What are the benefits and disadvantages of the ApfR?
3. Was there any resistance to implementing the ApfR in your area? By whom? Why?

(B) Role of PMMS in supporting EPCOR's strategic goals:

4. How is the ApfR linked to EPCOR's strategy?
5. What is the content of the ApfR for your area of responsibility (i.e. objectives, performance measures)? How and why were these items chosen?
6. How difficult are the performance goals for your area of responsibility?
7. Are financial goals set under the ApfR more or less difficult than they were prior to use of the ApfR?
8. Is the ApfR used in evaluating your performance? How often?
9. How important is attainment of ApfR goals to your performance evaluation?

(C) Impact of ApfR on behavior:

10. Has the ApfR affected your understanding of EPCOR'S strategic goals? How?
11. Has use of the ApfR affected your understanding of how your actions affect achievement of the organization's strategic goals? How?
12. Has the ApfR affected your understanding of the factors driving financial and non-financial performance at the corporate level? Within your area of responsibility?
13. Has use of the ApfR affected your decision-making (e.g. setting priorities, allocating resources)? How?
14. Has use of the ApfR changed your responsibilities? How?
15. How much control do you have over the factors affecting outcomes on performance measures under your responsibility?
16. Is controllability of the factors affecting outcomes on performance measures considered by your superiors when they evaluate your performance?
17. Has the ApfR affected your assessment of your ability to achieve performance targets? How?
18. Has use of the ApfR affected your commitment to achieving performance goals for which you are accountable? How?
19. Has use of the ApfR affected your employees? How?
20. Is the ApfR used in evaluating their performance?

Table 2: Calculation of Effect Sizes for a Selected Sample of Goal-Setting Studies

Study[2]	Independent Variable	Goal Commitment Effect Size[1]	Personal Goal Effect Size[1]
1. Earley (1985)	Task information	.64	.53
	Goal choice	.26	.30
	Task complexity	.49	.30
2. Earley (1986)	Information type	.64	.76
	Information source	.30	.32
3a. Earley and Lituchy (1991) (study 1)	Goal Difficulty	n/a	.93
3b. Earley and Lituchy (1991) (study 2)	Goal Difficulty	n/a	.48
4. Garland and Adkinson (1987)	Goal Difficulty	n/a	1.03
	Persuasion	n/a	.47
5. Hollenbeck et al. (1989b)	Information source	.03	n/a
	Need for achievement	.21	n/a
6. Huber (1985)	Goal difficulty	.21	n/a
	Task difficulty	.56	n/a
7. Kren (1990)	Incentive scheme	.39	.40
	Budget participation	.28	.38
8. Lee et al. (1997)	Goal difficulty	.11	.41
	Incentive scheme	.08	.22
9. Podaskoff and Farh (1989)	Feedback sign	n/a	.25
	Feedback credibility	n/a	.12
10. Tziner and Kopelman (1988)	Feedback format	.80	n/a
11a. Wood, Bandura and Bailey (1990) (study 1)	Task complexity	n/a	.29
	Goal specificity	n/a	0
11b. Wood et al. (1990) (study 2)	Task complexity	n/a	.12
	Goal specificity	n/a	.12
12a. Wood, Atkins and Bright (1999) (study 1)	Incentive scheme	.22	.61
12b. Wood et al. (1999) (study 2)	Incentive scheme	.20	.05
12c. Wood et al. (1999) (study 3)	Incentive scheme	.18	.96
13a. Wright and Kacmar (1994) (study 1)	Goal difficulty	.13	n/a
	Goal specificity	.29	n/a
13b. Wright and Kacmar (1994) (study 2)	Goal specificity	.23	.87

[1]The formula used to calculate the effect size (f) is: $d/2\ [(k+1)/3(k-1)]^{1/2}$ (Cohen 1988)

$d = (M_{max} - M_{min})/\sigma$

M_{max} = largest mean for dependent variable across all experimental conditions

M_{min} = smallest mean for dependent variable across all experimental conditions

σ = largest standard deviation for all experimental conditions

k = number of groups

[2]Only studies that reported means and standard deviations for goal commitment or personal goals for all experimental conditions were included in the analysis.

Table 3: Scale Items Included in Different Approaches Used to Measure Goal Commitment

Scale Item	Combinations Employed[1] 1	2	3	4
1. It's hard to take this goal seriously.	√	√		√
2. It's unrealistic for me to expect to reach this goal.	√	√		√
3. It's quite likely that this goal may need to be revised, depending on how things go.	√	√		√
4. There is not much to be gained by trying to achieve this goal.	√			
5. Quite frankly I don't care if I achieve this goal or not.	√	√	√	√
6. I am strongly committed to pursuing this goal.	√	√	√	
7. It wouldn't take much to make me abandon this goal.	√	√	√	
8. I think this goal is a good goal to shoot for.	√	√	√	
9. I am willing to put in a great deal of effort to achieve this goal.	√		√	

[1] 1 = Hollenbeck et al. (1989a); Wright (1992)
2 = Klein (1991); Klein and Kim (1998); Klein and Wright (1994); Wright and Kacmar (1994)
3 = Brown et al. (1998); Deshon and Landis (1997)
4 = Hollenbeck et al. (1989b)

Table 4: Other Measures Collected in the Experimental Materials

Participants' Background

Number of years full-time work experience
Number of years with current employer
Number of employees supervised
Highest level of education
Job title
Familiarity with electronic commerce settings used in the cases[1]
Work experience with electronic commerce settings used in the cases[1]

Company Information

Industry
Number of employees
Annual revenue
Total Assets
Type of performance measurement system used[1]
Years using performance measurement system
Usefulness of performance measurement system

[1] Measures collected because of their potential impact on the dependent variables. Participants separately rated their familiarity and work experience with e-commerce on 7-point scales. The scale endpoints for the familiarity measure were: 1 = not familiar at all; and 7 = very familiar. For the work experience measure: 1 = no experience; 7 = extensive experience. Participants responded "yes"/ "no" to the question: "Does your company use a performance measurement system with similarities to those described in the cases?"

Table 5: Experimental Procedures and Order of Case Materials Presentation

Case Section		Details
1	Case Details	· Participants' role explained; background information provided on ECB · Financial performance goal assigned; planning assumptions provided · Difficulty of financial performance goal described and quantified
	Measure Collected	· Financial goal difficulty manipulation check
2	Case Details	· SPMS information presented: ~ Proposed causal relationships identified ~ Customer values and employee requirements identified ~ Objectives, performance measures, goals provided
	Measures Collected	· Strength of causal-linkage manipulation check
3	Case Details	· Final SPMS details provided: ~ Difficulty and achievability of SPMS non-financial goals quantified/described ~ SPMS incentive details outlined
	Measures Collected	· Dependent variables; self-efficacy for financial and non-financial goals; attractiveness of financial and non-financi goals; manipulation checks
4	*Measures Collected*	· Demographic information
5		· Sections 1 - 3 presented for second case
6	*Measures Collected*	· Self-reported ability; other background information

Table 6: Participants' Background; Reactions to Case Materials and Details about their Employers

Panel A: Participants' Background (n=56 unless otherwise noted):

1.Professional Experience:	Mean	Median	Mode	Standard Deviation
Years full-time experience	18.9	19.0	16.0	7.5
Years with current employer	12.0	12.0	12.0	7.6
Number of employees supervised	18.0	6.5	4.0	29.8
E-commerce familiarity [1,2]	4.2	4.5	2.0	1.7
E-commerce experience [1,2]	3.2	2.5	2.0	1.8

2. Job title:	Number	Percentage
Manager	26	46%
Vice President	7	13%
Director	6	11%
Supervisor	5	9%
Senior	4	7%
Leader	3	5%
Other	5	9%
Total	56	100%

3. Education:	Number	Percentage
High School	11	20%
Undergraduate degree	27	48%
Masters Degree	18	32%
Total	56	100%

4. Responsible for achieving goals:	Number	Percentage
Yes	52	92%
No	2	4%
Missing	2	4%
Total	56	100%

Table 6 continued: Participants' Background; Reactions to Case Materials and Details about their Employers

Panel B: Participants' Reactions to Case Materials[2]:

	Mean	Median	Mode	Standard Deviation
1. Realism of cases[3]	4.4	5.0	5.0	1.1
2. Understandability of materials[3]	5.0	5.0	6.0	1.3
3. Difficulty in completing requirements[3]	3.1	3.0	3.0	1.3
4. Total time to complete cases (minutes)[4]	70.0	66.2	50.0	27.1

Panel C: Details about participants' employers

1. Industry:	Number	Percentage
Banking	13	23%
Insurance	11	20%
Natural Resources	11	20%
Utilities	10	17%
Retail	6	11%
Manufacturing	4	7%
Transportation	1	2%
Total	56	100%

2. Company size:	Median[5]
Employees	3,000
Total revenues	$200 million
Total assets	$10 billion

3. Company uses SPMS similar in nature to those in cases:

	Number	Percentage
Yes	40	71%
No	14	25%
Missing	2	4%
Total	56	100%

4. Number of years company has used SPMS:

	Number	Percentage
Less than 5 years	19	47%
More than 5 years	21	53%
Total	40	100%

	Mean	Median	Mode	Standard Deviation
5. Participants rating of SPMS usefulness[6]	4.9	5.0	6.0	1.6

Table 6 continued: Participants' Background; Reactions to Case Materials and Details about their Employers

[1] n = 54 because of missing data.
[2] Participants separately rated their familiarity and work experience with E-commerce on 7-point scales. The scale endpoints for the familiarity measure were: 1 = not familiar at all; and 7 = very familiar. For the work experience measure: 1 = no experience; 7 = extensive experience.
[3] On 7-point scales, participants rated the: realism of the cases (1 = not realistic at all; 7 = very realistic); understandability of the materials (1 = not at all understandable; 7 = very understandable); and difficulty of the requirements (1 = not difficult at all; 7= very difficult).
[4] Figures exclude two outliers: 356 minutes and 200 minutes. Two modes exist: 50 and 75 minutes.
[5] Median values are reported because the two large financial institutions included in the sample distort the means for these items.
[6] Participants rated the usefulness of their company's SPMS on a 7-point scale. The anchors were: 1 = not very useful; 7 = very useful.

Table 7: Intercorrelations Among Individual Goal Commitment Items (n = 56)

Panel A: "Weak" Causal-Linkage Financial Goal Commitment[1]

	1	2	3	4	5
Item 1[2]	1.0				
Item 2[2]	.64	1.0			
Item 3[2]	.51	.41	1.0		
Item 4[2]	.57	.73	.65	1.0	
Item 5[2]	.60	.71	.61	.96	1.0

Panel B: "Strong" Causal-Linkage Financial Goal Commitment[1]

	1	2	3	4	5
Item 1	1.0				
Item 2	.62	1.0			
Item 3	.68	.71	1.0		
Item 4	.73	.73	.87	1.0	
Item 5	.71	.72	.84	.94	1.0

Panel C: "Weak" Causal-Linkage Non-Financial Goal Commitment[1]

	1	2	3	4	5
Item 1	1.0				
Item 2	.74	1.0			
Item 3	.66	.77	1.0		
Item 4	.77	.85	.84	1.0	
Item 5	.77	.85	.81	.96	1.0

Panel D: "Strong" Causal-Linkage Non-Financial Goal Commitment[1]

	1	2	3	4	5
Item 1	1.0				
Item 2	.71	1.0			
Item 3	.46	.49	1.0		
Item 4	.61	.67	.81	1.0	
Item 5	.68	.76	.66	.85	1.0

[1] All correlations are significant at the $p < .005$ level.

[2] Item definitions:

Item 1: I would care if I achieved this goal.
Item 2: It would take a lot to make me abandon this goal.
Item 3: I think this would be a good goal to strive for.
Item 4: I would be strongly committed to achieving this goal.
Item 5: I would be willing to put in a great deal of effort to achieve this goal.

Table 8: Analysis of Goal Commitment Measure Dimensionality and Reliability (n = 56)

	Goal Commitment Measure			
	"Weak" Linkages Financial Goal Commitment	"Strong" Linkages Financial Goal Commitment	"Weak" Linkages Non-Financial Goal Commitment	"Strong" Linkages Non-Financial Goal Commitment
Panel A: Principal Components Analysis				
(1) Results for 1st factor:				
Factor loadings				
Item 1[1]	.774	.829	.856	.803
Item 2[1]	.831	.838	.919	.846
Item 3[1]	.738	.917	.889	.794
Item 4[1]	.936	.955	.967	.920
Item 5[1]	.931	.946	.960	.925
Eigenvalue	3.58	4.04	4.22	3.69
Variance explained	71.5%	80.8%	84.5%	73.9%
(2) Results for 2nd factor:				
Factor loadings				
Item 1[1]	-.244	.537	.487	.435
Item 2[1]	-.423	-.269	-.024	.365
Item 3[1]	.610	-.114	-.317	-.533
Item 4[1]	.069	-.053	-.073	-.261
Item 5[1]	.028	-.068	-.043	.006
Eigenvalue	.62	.38	.34	.67
Variance explained	12.3%	7.6%	6.9%	13.5%
Panel B: Scale Reliability Analysis				
Cronbach's Alpha	.89	.93	.95	.90

[1] Item 1: I would care if I achieved this goal.
Item 2: It would take a lot to make me abandon this goal.
Item 3: I think this would be a good goal to strive for.
Item 4: I would be strongly committed to achieving this goal.
Item 5: I would be willing to put in a great deal of effort to achieve this goal.

Table 9: Descriptive Statistics and Pairwise Correlations among Managerial Ability Measures

Panel A: Descriptive Statistics for Ability Measures[1] (n = 54)

	Mean	Median	Mode	Standard Deviation
1. Planning	5.5	6	6	1.0
2. Investing	5.3	5	6	.97
3. Coordinating	5.3	5.5	6	1.1
4. Evaluating	5.5	6	6	1.1
5. Supervising	5.2	5	6	1.2
6. Staffing	5.1	5	4	1.1
7. Negotiating	4.8	5	5	1.2
8. Representing	5.3	6	6	1.1
9. Overall	5.5	6	6	.77
Ability Percentile[2]	24.8%	20.0%	20.0%	17.9%

Panel B: Pairwise Correlations Among the Ability Dimensions Items (n = 54)

	1	2	3	4	5	6	7	8	9
1. Planning	1.0								
2. Investing	.35**	1.0							
3. Coordinating	.34*	.49**	1.0						
4. Evaluating	.48**	.36**	.17	1.0					
5. Supervising	.33*	.34*	.49**	.37**	1.0				
6. Staffing	.50**	.21	.23	.49**	.51**	1.0			
7. Negotiating	.20	.06	.16	.20	.26	.31*	1.0		
8. Representing	.39**	.30*	.28*	.29*	.28*	.50**	.59**	1.0	
9. Overall	.57**	.45**	.52**	.43**	.59**	.52**	.58**	.68**	1.0

[1] Participants rated their ability on each dimension using a 7-point scale (1 = well below average; 7 = well above average).

[2] Participants rated their overall ability (expressed as a percentile) relative to other managers in their company.

* $p < .05$; ** $p < .01$

Table 10: Results for Controlled Variables and Participants' Understanding of the Reward System

Panel A: Controlled Variables: Means (Standard Deviations) (n=56)

Variable	Weak Causal-Linkage Case	Strong Causal-Linkage Case
1. Financial goal difficulty[1]	2.52 (2.26)	1.91 (2.58)
2. Financial goal attractiveness[2]	2.69 (2.69)	2.98 (2.70)
3. Non-financial measure controllability[3]	4.34 (1.43)	4.89 (1.11)
4. Non-financial goal difficulty[4]	1.21 (2.91)	1.95 (2.45)

Panel B: Participants Understanding of Reward System Details (n=55)

Variable	Weak Causal-Linkage Case	Strong Causal-Linkage Case
1. Bonus affected by financial goal achievement[5]	3.25 (2.44)	3.31 (2.36)
2. Bonus affected by non-financial goal achievement[6]	1.82 (2.84)	2.65 (2.41)

[1] Participants rated their agreement with the statement that the assigned financial goal is difficult. An 11-point scale was used: -5 = strongly disagree and +5 = strongly agree.

[2] Participants rated their agreement with the statement that the assigned financial goal would be attractive to achieve. An 11-point scale was used: -5 = strongly disagree and +5 = strongly agree.

[3] Participants rated the controllability of outcomes on the non-financial measures. A 7-point scale was used: 1 = not at all controllable and 7 = very controllable.

[4] Participants rated their agreement with the statement that the assigned non-financial goals are difficult. An 11-point scale was used: -5 = strongly disagree and +5 = strongly agree.

[5] Participants rated their agreement with the statement that bonuses are directly affected by achieving the financial goal. An 11-point scale was used: -5 = strongly disagree and +5 = strongly agree.

[6] Participants rated their agreement with the statement that non-financial goals are only rewarded to the extent they contribute to achieving the financial goal. An 11-point scale was used: -5 = strongly disagree and +5 = strongly agree.

Table 11: Participants' Reactions to the Plausibility of the Causal-Linkages Contained in the Proposed SPMS in Each Case (n =55)

Panel A: Responses for Weak Causal-Linkage Case[1]

Item	Number (%) Agree	Disagree or Unsure	χ^2
1. Increasing product development staff job input will improve their promptness.[2]	18 (33%)	37 (67%)	6.56**
2. Improving product development staff promptness will improve their image with customers.[2]	32 (58%)	23 (42%)	1.47
3. Improving the image of product development staff with customers will lead to increased Internet Services revenue.[2]	33 (60%)	22 (40%)	2.20
4. Implementing employee suggestions will result in more product development staff submitting suggestions.[3]	43 (78%)	12 (22%)	17.47**
5. Increasing the percentage of employees who submit suggestions will result in fewer late arrivals for work.[3]	10 (18%)	45 (82%)	22.27**
6. Fewer late arrivals for work will improve customer ratings of product development staff openness and friendliness.[3]	14 (25%)	41 (75%)	13.25**
7. Improving customer ratings of product staff openness and friendliness will lead to increased Internet Services revenue.[3]	34 (62%)	21 (38%)	3.07

Table 11 continued: Participants' Reactions to the Plausibility of the Causal-Linkages Contained in the Proposed SPMS in Each Case (n =55)

Panel B: Responses for Strong Causal-Linkage Case[1]

Item	Number (%) Agree	Disagree or Unsure	χ^2
1. Developing the strategic skills of Home Banking programming staff will lead to development of a reliable and functional product.[2]	45 (82%)	10 (18%)	22.27**
2. Development of a reliable and functional product will allow Home Banking to satisfy key customer requirements.[2]	53 (96%)	2 (4%)	47.29**
3. Satisfying key customer requirements will lead to an increase in Electronic Banking product revenue.[2]	45 (82%)	10 (18%)	22.27**
4. Training will provide the technical skills necessary to develop a reliable and functional product.[3]	44 (80%)	11 (20%)	19.80**
5. Spending time on R and D activities will positively affect product security/functionality ratings.[3]	47 (85%)	8 (15%)	27.65**
6. Security/functionality ratings will positively affect overall product quality ratings.[3]	52 (94%)	3 (6%)	43.65**
7. Overall product quality will lead to growth in Electronic Banking fee revenues.[3]	46 (84%)	9 (16%)	24.89**

[1] Each item represents a proposed cause-effect relationship contained in the SPMS. For each item participants were asked whether they agreed, disagreed or were unsure about the plausibility of the causal relationship. The χ^2 test is used to evaluate the null hypothesis that response frequencies for "agree" and "disagree/unsure" are equal.

[2] Items identified as objectives in the SPMS.

[3] Items identified as specific performance measures in the SPMS.

** $p < .01$

Table 12: Results of Manipulation Checks for Causal-Linkage Strength

Panel A: Means (Standard Deviations) of each manipulation check measure (n=56)

	Weak Causal Linkages	Strong Causal Linkages
Objectives[1]	-0.95 (3.20)	2.82 (1.31)
Measures[2]	-1.36 (3.03)	1.95 (1.98)
Overall[3]	2.68 (1.63)	5.18 (1.13)

Panel B: Correlations among Measures for Weak Causal-Linkage Strength Case (n=56)

	Measure 1	Measure 2	Measure 3
Objectives[1]	1.0		
Measures[2]	.65**	1.0	
Overall[3]	.71**	.63**	1.0

Panel C: Correlations among Measure for Strong Causal-Linkage Strength Case (n=56)

	Measure 1	Measure 2	Measure 3
Objectives[1]	1.0		
Measures[2]	.55**	1.0	
Overall[3]	.63**	.56**	1.0

[1] Objectives: Participants rated their agreement with the statement that the SPMS identifies non-financial objectives that should lead to the objective of increasing revenues. An 11-point scale was used: -5 = strongly disagree and +5 = strongly agree.

[2] Measures: Participants rated their agreement with the statement that the SPMS identifies non-financial performance measures that should lead to the goal of increasing revenues by 75%. An 11-point scale was used: -5 = strongly disagree and +5 = strongly agree.

[3] Overall: Participants rated the overall strength of the causal-linkages between performance on the non-financial measures in the proposed SPMS and revenue growth. A 7-point scale was used: 1 = very weak and 7 = very strong.

Table 13: Multivariate Repeated Measures Analysis of Causal-Linkage Strength Manipulation (n = 56)

Factor[1,2,3]	Wilk's Lambda	Df (H, Error)	F	p
Within Ss				
Causal	.334	3, 49	32.50	.001
Causal x order	.928	3, 49	1.26	.297
Causal x version	.946	3, 49	.93	.432
Causal x achieve	.905	3, 49	1.71	.177
Causal x financial	.973	3, 49	.45	.718

[1] *Causal* is the within Ss manipulation of SPMS causal-linkage strength. *Order* is the between Ss order of the materials (weak or strong causal-linkage case first). *Version* is the between Ss administration approach: internet or Access database. *Achieve* is the between Ss non-financial goal achievability condition (low achievability, moderate achievability). *Financial* is the between Ss company type (financial services and non-financial services).

[2] The set of dependent variables in the analysis is:
Objectives: rating of causal-linkage strength between SPMS financial and non-financial objectives.
Measures: rating of causal-linkage strength between SPMS financial and non-financial performance measures.
Overall: rating of overall strength of causal-linkages contained in the SPMS.

[3] To avoid unnecessarily reducing the degrees of freedom for significance tests, only 2-way interactions are examined.

Table 14: Results of Non-Financial Goal Achievability Manipulation

Panel A: Participants' probability estimates for achieving the non-financial goals by achievability condition[1]

	Goal Achievability Condition means (standard deviations)	
	Low (n = 29)	Moderate (n = 27)
Probability estimate	51.3% (22.6%)	67.0% (12.9%)

Panel B: Participants' probability estimates for achieving the non-financial goals by case and achievability condition

	Goal Achievability Condition means (standard deviations)	
Causal-linkage strength	Low (n=29)	Moderate (n=27)
Weak	51.5% (25.1%)	66.7% (18.2%)
Strong	51.1% (26.4%)	67.4% (15.0%)

Panel C: Participants belief in the achievability of the non-financial Goals[2]

	Goal Achievability Condition	
	Low (n = 29)	Moderate (n = 27)
Weak causal-linkages		
Yes	18 (62%)	24 (89%)
No	11 (38%)	3 (11%)
Totals	29 (100%)	27 (100%)
Strong-causal-linkages		
Yes	21 (72%)	26 (96%)
No	8 (28%)	1 (4%)
	29 (100%)	27 (100%)

Panel D: Probability ranges participants assigned to qualitative descriptions of goal achievability categories

	Achievability Category		
Average Probability	Low	Moderate	High
Lower limit	10.8%	37.8%	68.3%
Upper limit	33.8%	64.5%	92.9%

[1] Participants estimated the probability of achieving the assigned non-financial goals. The values in Panel A were constructed by: (a) averaging the probabilities for the two cases completed by each participant and (b) calculating the means and standard deviations of (a) for each achievability condition.
[2] Participants indicated whether they believed the assigned non-financial goals could be achieved (yes/no).
[3] Participants quantified the probabilities they would assign to performance goals with a low, moderate and high likelihood of achievement.

Table 15 Repeated Measures ANOVA of Participants' Probability Estimates for Achieving the Non-Financial Goals

Between Ss results for factors included in the model (n=56)[1]:

Source[2]	Type III Sum of Squares	df	Mean Square	F	p
Achieve	6918.8	1	6918.8	10.9	.002
Order	1571.5	1	1571.5	2.5	.123
Version	3.3	1	3.3	.01	.943
Financial	990.4	1	990.4	1.5	.218
Achieve x order	1338.1	1	1338.1	2.1	.153
Achieve x version	4.81	1	4.81	.01	.931
Achieve x financial	1149.5	1	1149.5	1.81	.185
Error	30524.2	48	597.1		

[1] Probability of achieving non-financial goal is the dependent variable. The between Ss factors are: "achieve", "order", "version" and "company".

[2] To avoid unnecessarily reducing the degrees of freedom for significance tests, only 2-way interactions involving "achieve" are included in the model.

Table 16: Descriptive Results for Dependent and Mediating Variables by Experimental Condition

	Means (Standard Deviations)		
	Weak Causal-Linkage Case	Strong Causal-Linkage Case	Average
A. Low Non-Financial Goal Achievability Condition (n=29)			
1. Non-financial goal commitment[1]	.25 (2.8)	2.9 (1.8)	1.6 (1.9)
2. Non-financial goal attractiveness[2,3]	.41 (3.2)	2.4 (2.9)	1.4 (2.5)
3. Financial goal commitment[4]	2.9 (1.9)	2.8 (2.1)	2.9 (1.6)
4. Personal goal[5]	58.7 (18.9)[7]	68.3 (15.2)	63.7 (14.5)
5. Financial goal self-efficacy "1"[3,6]	192.0 (127.0)[7]	276.3 (123.1)	238.7 (93.5)
6. Financial goal self-efficacy "2"[6]	155.8 (137.7)[7]	251.7 (125.6)	203.8 (99.2)
B. Moderate Non-Financial Goal Achievability Condition (n=27)			
1. Non-financial goal commitment	.78 (2.8)	3.5 (1.2)	2.2 (1.4)
2. Non-financial goal attractiveness	1.4 (3.3)	2.9 (1.8)	2.1 (2.0)
3. Financial goal commitment	3.9 (.9)	3.8 (1.1)[8]	3.9 (.95)
4. Personal goal	56.7 (22.7)	68.1 (14.3)	62.4 (14.0)
5. Financial goal self-efficacy "1"	179.9 (103.9)	295.6 (119.4)	237.7 (90.0)
6. Financial goal self-efficacy "2"	143.0 (123.3)	271.3 (127.6)	207.1 (99.2)
C. Combined Non-Financial Goal Achievability Conditions (n=56)			
1. Non-financial goal commitment	.51 (2.8)	3.2 (1.6)	1.8 (1.7)
2. Non-financial goal attractiveness	.89 (3.3)	2.6 (2.4)	1.7 (2.3)
3. Financial goal commitment	3.4 (1.6)	3.3 (1.8)	3.3 (1.4)
4. Personal goal	57.7 (20.7)	68.2 (14.7)	63.1 (14.1)
5. Financial goal self-efficacy "1"	186.1 (115.3)	285.6 (120.6)	238.2 (91.0)
6. Financial goal self-efficacy "2"	149.5 (129.7)	261.3 (125.8)	205.4 (98.3)

[1] Responses are averaged for the 5-items included in the non-financial goal commitment measure (see section 6.2).
[2] Participants rated the attractiveness of the set of non-financial goals on an 11-point scale (-5 = very unattractive, +5 = very attractive).
[3] Mediating variable.
[4] Responses are averaged for the 5-items included in the financial goal commitment measure (see section 6.2).
[5] Participants' self-set goal for revenue growth.
[6] Sum of participants' probability assessments for achieving each of 5 different revenue growth goals (see section 5.6.1). Measure "1" is the sum of probabilities for all 5 goals. Measure "2" includes only the probability assessments for goals participants indicated they believed could be achieved ("yes").
[7] n=28 because of missing data.
[8] n=26 because of missing data.

Table 17: Total Correlation Matrix for Independent, Mediating and Dependent Variables

Variables[1]	1	2	3	4	5	6	7	8	9
1. SPMS causal-linkage strength[2]	1.0								
2. Non-financial goal achievability[3]	n/a	1.0							
3. Non-financial goal self-efficacy[4]	.01	37**	1.0						
4. Non-financial goal commitment	.50**	.11	.16	1.0					
5. Non-financial goal attractiveness[5]	.30**	.10	.22*	.63**	1.0				
6. Financial goal commitment[6]	-.06	28**	.38**	.24*	.24*	1.0			
7. Personal goal[6]	.29**	-.04	.36**	.33**	.33**	.25**	1.0		
8. Financial goal self-efficacy "1"[5,6]	.41**	-.01	.25**	.60**	.45**	.27**	.55**	1.0	
9. Financial goal self-efficacy "2"[5,6]	.40**	.01	.24**	.60**	.45**	.31**	.55**	.95**	1.0

[1] Pearson correlations are based on participants' responses to both cases and therefore the observations are not independent (n=112).
[2] Dummy coded (1= "strong" causal-linkage case; 0 = "weak" causal-linkage case) for purposes of calculating correlations. Significance levels using Spearman correlations do not differ qualitatively from those reported above.
[3] Dummy coded (1= "moderate" non-financial goal achievability; 0 = "low" non-financial goal achievability) for purposes of calculating correlations. Significance levels using Spearman correlations do not differ qualitatively from those reported above except for Financial goal commitment (.19), which is significant at the .05 level.
[4] Participants' estimated probability of achieving non-financial goals.
[5] Mediating variable.
[6] n=110 because of missing data.
* $p < .05$, ** $p < .01$

Table 18: Multivariate Repeated Measures Analysis of the Effects of Order, Version and Company Type on Financial Goal Commitment, Personal Goals and Non-financial Goal Commitment

Panel A: Within Ss multivariate results[1,2] (n=54)				
Within Subjects Factor	Wilk's Lambda	Df (hypothesis, error)	F	p
Causal	.533	3,47	13.72	.001
Causal x order	.902	3,47	1.70	.181
Causal x version	.895	3,47	1.85	.152
Causal x achieve	.994	3,47	.09	.963
Causal x company	.929	3,47	1.19	.324

Panel B: Between Ss multivariate results[3] (n=54)				
Between Subjects Factor	Wilk's Lambda	Df (hypothesis, error)	F	p
Achieve	.827	3,44	3.08	.037
Order	.764	3,44	4.54	.007
Version	.998	3,44	.03	.991
Company	.883	3,44	1.94	.137
Achieve x order	.942	3,44	.91	.446
Achieve x version	.983	3,44	.25	.863
Achieve x company	.975	3,44	.38	.767

[1] The dependent variables in the model are: financial goal commitment; personal goals; and non-financial goal commitment. "Causal" is the within Ss factor and the between Ss factors are: "achieve", "order", "version" and "company". To conserve degrees of freedom the model includes only 2-way interactions involving "causal" and the between Ss factors. N=54 because of one missing observation for each of Financial Goal Commitment and Personal Goals.

[2] Analysis of the model's residuals reveals violations of the MANOVA assumptions of normality (negative skewness) and homogeneity of covariance. A power transformation of the dependent variables (financial goal commitment: $y = x^2$; non-financial goal commitment: $y = x^3$) was used to normalize the residuals (Jobson 1992). The model was re-run using the transformed variables and satisfies all MANOVA assumptions. The p-values using the transformed variables do not differ qualitatively from those reported above.

[3] The between Ss results are based on re-running the model in Panel A to include two-way interactions between "Achieve" and the other three between Ss factors. This modification accounts for the change in df from 47 in Panel A to 44 in Panel B.

Table 19: Repeated Measures Analysis of Experimental Results

Panel A: Dependent Variable – Financial Goal Commitment (n=54)[1,2]

		Hypothesis			
Within subjects:	SS	df	MS	F	p
Causal	.66	1	.66	.375	.543
Causal x achieve	.20	1	.20	.116	.735
Error	91.13	52	1.75		
Between subjects:					
Achieve[4]	22.27	1	22.27	6.67	.013
Error	173.83	52	3.36		

Panel B: Dependent Variable Personal – Goals for Financial Measure (n=55)[2,3]

		Hypothesis			
Within subjects:	SS	df	MS	F	p
Causal[4]	3171.45	1	3171.45	12.86	.001
Causal x achieve	15.08	1	15.08	.06	.806
Error	13070.37	53	246.61		
Between subjects:					
Achieve	49.55	1	49.55	.12	.730
Error	21599.54	53	407.54		

Panel C: Dependent Variable – Non-Financial Goal Commitment (n=56)[3]

		Hypothesis			
Within subjects:	SS	df	MS	F	p
Causal[4]	203.59	1	203.59	43.92	.001
Causal x achieve	.07	1	.07	.01	.903
Error	250.33	54	4.64		
Between subjects:					
Achieve	9.63	1	9.63	1.65	.204
Error	314.25	54	5.82		

[1] "Causal" is the within Ss factor ("weak" and "strong" causal-linkages) and the between Ss factor is "achieve" ("low" and "moderate" non-financial goal achievability).

[2] n= 54 because of 1 missing observation. Another observation was excluded because the participant did not complete the financial goal self-efficacy measure for one of the cases. The exclusion allows consistency (i.e. same "n") between the results reported here and the mediation analysis reported in Table 22. Including this observation in Panel A improves the main effect for "Achieve" to $p < .01$. No other results are affected.

[3] One observation was excluded because of missing financial goal self-efficacy data (see footnote 2). Inclusion of the observation has no impact on the significance levels reported in Panel B.

[4] Power analysis shows the power (effect size) for "achieve" (financial goal commitment) is: .76 (.36); "causal" (personal goals): 99 (.79); "causal" (non-financial goal commitment): .78 (.37) (Coehn 1988).

Table 20: Supplementary Analysis of the Effects of Non-Financial Goal Self-Efficacy on the Dependent Variables and Financial Goal Self-Efficacy[1]

Panel A: Regression of Financial Goal Commitment (FGC) on Non-Financial Goal Self-Efficacy (NFGSE) (n=54)

$FGC_i = \beta_0 + \beta_1(ACHIEVE_i) + \beta_2(NFGSE_i) + \varepsilon_i$

	Standardized Coefficient Estimates (t-statistics in parentheses)		
Intercept	ACHIEVE	NFGSE	R^2
1.54	.13	.47	.29
(2.77)**	(.96)	(3.54)**	

Panel B: Regression of Personal Goals (PG) on Non-Financial Goal Self-Efficacy (NFGSE) (n=55)

$PG_i = \delta_0 + \delta_1(ACHIEVE_i) + \delta_2(NFGSE_i) + \varepsilon_i$

	Standardized Coefficient Estimates (t-statistics in parentheses)		
Intercept	ACHIEVE	NFGSE	R^2
45.02	-.23	.43	.16
(7.34)**	(-1.66)	(3.08)**	

Panel C: Regression of Non-Financial Goal Commitment (NFGC) on Non-Financial Goal Self-Efficacy (NFGSE) (n=56):

$NFGC_i = \gamma_0 + \gamma_1(ACHIEVE_i) + \gamma_2(NFGSE_i) + \varepsilon_i$

	Standardized Coefficient Estimates (t-statistics in parentheses)		
Intercept	ACHIEVE	NFGSE	R^2
1.24	.13	.11	.04
(1.56)	(.89)	(.72)	

Table 20 continued: Supplementary Analysis of the Effects of Non-Financial Goal Self-Efficacy on the Dependent Variables and Financial Goal Self-Efficacy[1]

Panel D: Regression of Financial Goal Self-Efficacy (FGSE) on Non-Financial Goal Self-Efficacy (NFGSE) (n=55)

$FGSE_i = \phi_0 + \phi_1(ACHIEVE_i) + \phi_2(NFGSE_i) + \varepsilon_i$

	Standardized Coefficient Estimates (t-statistics in parentheses)		
Intercept	ACHIEVE	NFGSE	R^2
157.72	-.13	.30	.07
(3.82)**	-(.91)	(2.04)*	

[1] ACHIEVE = non-financial goal achievability condition (effects coded: 1=moderate achievability, -1=low achievability). NFGSE = non-financial goal self-efficacy (participants' probability estimate for achieving the non-financial goals).

[2] An analysis of residuals indicates the assumptions of normality (K-S test, Q-Q plots) and constant variance (correlations between ε^2 and independent variables; correlations between $|\varepsilon|$ and standardized predicted values; and scatterplots) are not violated. A review of variance inflation factors (VIF) and condition indices (CI) (Jobson 1992) indicates multicollinearity is not serious in any of the models. All VIF's (CI's) were well below 10 (100), the cut-offs recommended by Jobson (1992) and Neter et al. (1985) for determining the severity of multicollinearity. Results obtained after removal of outliers identified by a review of influence statistics (Cook's distance, and standardized residuals) do not differ qualitatively from those reported above.

*$p < .05$, ** $p < .01$

Table 21: Pearson Correlations Among the Dependent Variables

Panel A: Pearson correlations among dependent variables averaged across all experimental conditions (n=54)

Variables	1	2	3
1.Non-financial goal commitment	1.0		
2. Financial goal commitment	.47**	1.0	
3. Personal goals	-.01	.30*	1.0

Panel B: Pearson correlations among dependent variables in "weak" causal-linkage case (n=55)

Variables	1	2	3
1. Non-financial goal commitment	1.0		
2. Financial goal commitment	.10	1.0	
3. Personal goals	.21	.27	1.0

Panel C: Pearson correlations among dependent variables in "strong" causal-linkage case (n=55)

Variables	1	2	3
1. Non-financial goal commitment	1.0		
2. Financial goal commitment	.74**	1.0	
3. Personal goals	.23	.33*	1.0

Panel D: Pearson correlations among dependent variables in "low" achievability condition (n=28)

Variables	1	2	3
1. Non-financial goal commitment	1.0		
2. Financial goal commitment	.20	1.0	
3. Personal goals	.04	.26	1.0

Panel E: Pearson correlations among dependent variables in "moderate" achievability condition (n=27)

Variables	1	2	3
1. Non-financial goal commitment	1.0		
2. Financial goal commitment	.53**	1.0	
3. Personal goals	-.03	.40	1.0

* $p < .05$; ** $p < .01$

Table 22: Analysis of Financial Goal Self-Efficacy and Non-Financial Goal Attractiveness as Mediators of the Relationship between SPMS Causal-Linkage Strength and the Dependent Variables [1,2]

Panel A: Mediating effects of Financial Goal Self-Efficacy (FGSE) on the relationship between Causal-Linkage Strength (CLS) and Personal Goals (PG)

Model 1[3]: $PG_i = \beta_0 + \beta_1(CLS_i) + \beta_2(CLS \times ACHIEVE_i) + \varepsilon_i$ (n=55)

	Standardized Coefficient Estimates (t-statistics in parentheses)		
Intercept	CLS	CLS x ACHIEVE	R^2
100.0	.29	.02	.08**[4]
(9.00)**	(3.59)**	(.25)	

Model 2[3]: $FGSE_i = \delta_0 + \delta_1(CLS_i) + \delta_2(CLS \times ACHIEVE_i) + \varepsilon_i$ (n=55)

	Standardized Coefficient Estimates (t-statistics in parentheses)		
Intercept	CLS	CLS x ACHIEVE	R^2
94.0	.41	.02	.17**
(1.30)	(5.37)**	(.04)	

Model 3[3]: $PG_i = \gamma_0 + \gamma_1(CLS_i) + \gamma_2(CLS \times ACHIEVE_i) + \gamma_3(FGSE) + \varepsilon_i$ (n=55)

	Standardized Coefficient Estimates (t-statistics in parentheses)			
Intercept	CLS	CLS x ACHIEVE	FGSE	R^2
89.7	-.02	-.01	.75	.26**
(11.2)**	-(.28)	-(.23)	(7.36)**	

Table 22 continued: Analysis of Financial Goal Self-Efficacy and Non-Financial Goal Attractiveness as Mediators of the Relationship between SPMS Causal-Linkage Strength and the Dependent Variables [1,2]

Panel B: Mediating effects of Non-Financial Goal Attractiveness (NFGA) on the relationship between Causal-Linkage Strength (CLS) and Non-Financial Goal Commitment (NFGC)

Model 1[3]: $NFGC_i = \beta_0 + \beta_1(CLS_i) + \beta_2(CLS \times ACHIEVE_i) + \varepsilon_i$ (n=56)

Standardized Coefficient Estimates (t-statistics in parentheses)

Intercept	CLS	CLS x ACHIEVE	R^2
1.30	.51	.01	.27**[4]
(.85)	(6.63)**	(.12)	

Model 2[3]: $NFGA_i = \delta_0 + \delta_1(CLS_i) + \delta_2(CLS \times ACHIEVE_i) + \varepsilon_i$ (n=56)

Standardized Coefficient Estimates (t-statistics in parentheses)

Intercept	CLS	CLS x ACHIEVE	R^2
-1.5	.29	-.04	.09**
-(.85)	(3.65)**	-(.51)	

Model 3[3]: $NFGC_i = \gamma_0 + \gamma_1(CLS_i) + \gamma_2(CLS \times ACHIEVE_i) + \gamma_3(NFGA) + \varepsilon_i$ (n=56)

Standardized Coefficient Estimates (t-statistics in parentheses)

Intercept	CLS	CLS x ACHIEVE	NFGA	R^2
1.98	.36	.03	.51	.35**
(1.50)	(4.91)**	(.46)	(4.50)**	

[1] The purpose of the models is to evaluate FGSE and NFGA as mediators of the CLS main effects reported in Table 19. To keep the regression models consistent with those results the interaction between CLS (strength of SPMS causal-linkages) and ACHIEVE (non-financial goal achievability) is included and effects coding (Jobson 1992) is used for CLS (1 = "strong" causal linkages; -1 = "weak" causal linkages) and ACHIEVE (1 = "moderate" achievability; -1 = "low" achievability).

[2] The repeated measures regression models include N-1 (55) dummy variables for the N=56 participants to control variation in the dependent variables due to between Ss differences (Coehn and Coehn 1983; Darlington 1990). For clarity of presentation, results on the participant dummy variables are not reported.

[3] An analysis of residuals indicates the assumptions of normality (K-S test; Q-Q plots) and constant variance (correlations between ε^2 and independent variables; correlations between $|\varepsilon|$ and standardized predicted values; and scatterplots) are not violated. A review of VIF's and CI's (Jobson 1992) indicates multicollinearity is not serious in any of the models. Influence statistics (Cook's distance, and standardized residuals) indicate no outliers are present.

[4] The reported R^2 for each model equals $R^2_{total} - R^2_{base}$ where: R^2_{total} is the R^2 for the model including all variables (reported and participant dummy variables) and R^2_{base} is the R^2 for model including just the participant dummy variables. The F-statistic for the change in R^2 was calculated using the formula: $[(R^2_{total} - R^2_{base})/q]/(1 - R^2_{total})/(n-p-1)]$ (Jobson 1992, pg. 231), where: q = number of regressors added; n = total number of observations; and p = total number of regressors.

* $p < .05$; ** $p < .01$

Table 23: Analysis of Financial Goal Self-Efficacy as a Mediator of the Relationship between Non-Financial Goal Achievability and the Dependent Variables [1]

Panel A: Mediating effects of Non-Financial Goal Self-Efficacy (NFGSE) and Financial Goal Self-Efficacy (FGSE) on the relationship between Non-Financial Goal Achievability (ACHIEVE) and Financial Goal Commitment (FGC)

Model 1[2]: $FGC_i = \beta_0 + \beta_1(ACHIEVE_i) + \varepsilon_i$ (n=54)

	Standardized Coefficient Estimates (t-statistics in parentheses)	
Intercept	ACHIEVE	R^2
3.4	.34	.11*
(19.42)**	(2.58)*	

Model 2[2]: $NFGSE_i = \delta_0 + \delta_1(ACHIEVE_i) + \varepsilon_i$ (n=54)

	Standardized Coefficient Estimates (t-statistics in parentheses)	
Intercept	ACHIEVE	R^2
59.0	.45	.20**
(24.05)**	(3.63)**	

Model 3[2]: $FGSE_i = \gamma_0 + \gamma_1(ACHIEVE_i) + \gamma_2(NFGSE_i) + \varepsilon_i$ (n=54)

	Standardized Coefficient Estimates (t-statistics in parentheses)		
Intercept	ACHIEVE	NFGSE	R^2
150.8	-.16	.32	.08
(3.55)**	-(1.04)	(2.13)*	

Model 4[2]: $FGC_i = \phi_0 + \phi_1(ACHEIVE_i) + \phi_2(NFGSE_i) + \phi_3(FGSE_i) + \varepsilon_i$ (n=54)

	Standardized Coefficient Estimates (t-statistics in parentheses)			
Intercept	ACHIEVE	NFGSE	FGSE	R^2
1.1	.16	.41	.19	.32**
(1.81)	(1.19)	(2.99)**	(1.59)	

Table 23 continued: Analysis of Financial Goal Self-Efficacy as a Mediator of the Relationship between Non-Financial Goal Achievability and the Dependent Variables [1]

Panel B: Mediating effects of Non-Financial Goal Self-Efficacy (NFGSE) and Financial Goal Self-Efficacy (FGSE) of the relationship between Non-Financial Goal Achievability (ACHIEVE) and Personal Goals (PG)

Model 1[2]: $PG_i = \beta_0 + \beta_1(ACHIEVE_i) + \beta_2(NFGSE_i) + \varepsilon_i$ (n=55)

Standardized Coefficient Estimates
(t-statistics in parentheses)

Intercept	ACHIEVE	NFGSE	R^2
45.0	-.23	.43	.16*
(7.34)**	-(1.66)	(3.08)**	

Model 2[2]: $NFGSE_i = \delta_0 + \delta_1(ACHIEVE_i) + \varepsilon_i$ (n=55)

Standardized Coefficient Estimates
(t-statistics in parentheses)

Intercept	ACHIEVE	R^2
58.6	.43	.18**
(23.9)**	(3.44)**	

Model 3[2]: $FGSE_i = \gamma_0 + \gamma_1(ACHIEVE_i) + \gamma_2(NFGSE_i) + \varepsilon_i$ (n=55)

Standardized Coefficient Estimates
(t-statistics in parentheses)

Intercept	ACHIEVE	NFGSE	R^2
157.7	-.13	.30	.07
(3.82)**	-(.91)	(2.04)*	

Model 4[3]: $PG_i = \phi_0 + \phi_1(ACHIEVE_i) + \phi_2(NFGSE_i) + \phi_3(FGSE_i) + \varepsilon_i$ (n=55)

Standardized Coefficient Estimates
(t-statistics in parentheses)

Intercept	ACHIEVE	NFGSE	FGSE	R^2
38.2	-.20	.35	.28	.23**
(5.70)**	-(1.43)	(2.47)*	(2.18)*	

[1] The models evaluate FGSE as a mediator of the main effect results reported in Table 19. To keep the regression models consistent with those results effects coding is used for ACHIEVE (1 = moderate achievability; -1 = low achievability).

[2] An analysis of residuals indicates the assumptions of normality (K-S test; Q-Q plots) and constant variance (correlations between ε^2 and independent variables; correlations between $|\varepsilon|$ and standardized predicted values; and scatterplots) are not violated. A review of VIF's and CI's (Jobson 1992) indicates multicollinearity is not serious in any of the models. Results obtained after removal of outliers (identified by a review of influence statistics: Cook's distance; standardized residuals) do not differ qualitatively from those reported above.

[3] The K-S test indicates non-normality of residuals. Transforming the dependent variable ($y = x^{1/2}$) to normalize the residuals results in no qualitative differences to significance levels compared to those reported for Model 4.

* $p < .05$; ** $p < .01$

Table 24: Analysis of the Effects of Non-Financial Goal Attractiveness and Non-Financial Goal Self-Efficacy on Non-Financial Goal Commitment[1]

Panel A: Both cases combined[2]

$NFGC_i = \beta_0 + \beta_1(NFGSE_i) + \beta_2(NFGATT_i) + \varepsilon_i$ (n=56)

	Standardized Coefficient Estimates (t-statistics in parentheses)		
Intercept	NFGSE	NFGATT	R^2
.53	.12	.55	.33**
(.87)	(1.10)	(4.83)**	

Panel B: Weak causal-linkage SPMS Case[2]

$NFGC_i = \delta_0 + \delta_1(NFGSE_i) + \delta_2(NFGATT_i) + \varepsilon_i$ (n=56)

	Standardized Coefficient Estimates (t-statistics in parentheses)		
Intercept	NFGSE	NFGATT	R^2
.24	-.03	.64	.40**
(.29)	-(.28)	(5.91)**	

Panel C: Strong causal-linkage SPMS case[2]

$NFGC_i = \gamma_0 + \gamma_1(NFGSE_i) + \gamma_2(NFGATT_i) + \varepsilon_i$ (n=56)

	Standardized Coefficient Estimates (t-statistics in parentheses)		
Intercept	NFGSE	NFGATT	R^2
1.46	.29	.33	.23**
(2.72)**	(2.32)*	(2.70)**	

[1] NFGSE = non-financial goal self-efficacy; NFGATT = non-financial goal attractiveness; and NFGC = non- financial goal commitment.

[2] An analysis of residuals indicates the assumptions of normality (K-S test, Q-Q plots) and constant variance (correlations between ε^2 and independent variables; correlations between $|\varepsilon|$ and standardized predicted values; and scatterplots) are not violated. A review of VIF's and CI's (Jobson 1992) indicates multicollinearity is not serious.

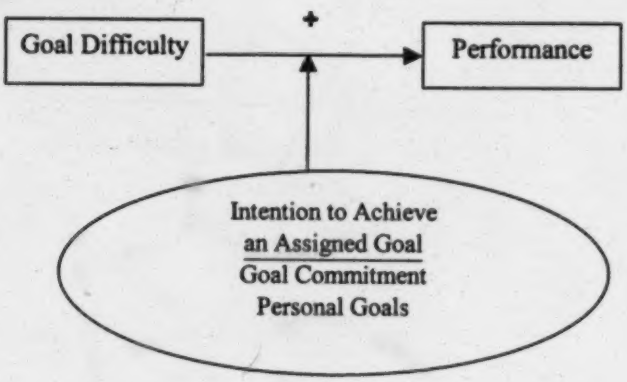
*$p < .05$, ** $p < .01$

Table 25: Summary of Hypotheses Tests

Hypothesis	Result	Related Analysis
Causal-Linkage Strength[1]:		
H1a	Not supported	Table 19 (Panel A)
H1b	**Supported**	**Table 19 (Panel B)**
H2	**Supported**	**Table 19 (Panel C)**
Non-Financial Goal Achievability[1]:		
H3a	**Supported**	**Table 19 (Panel A)**
H3b	**Partially Supported**	**Table 20 (Panel B)**
H4	Not Supported	Table 19 (Panel C)
Dependent Variable Correlations:		
H5a	**Partially Supported**	**Tables 17 and 21**
H5b	**Partially Supported**	**Tables 17 and 21**
Mediating Effects[2]:		
H6a	Not supported	
H6b	**Supported**	**Table 22, Panel A**
H6c	**Supported**	**Table 22, Panel B**
H7a	Not supported	Table 23, Panel A
H7b	**Supported**	**Table 23, Panel B**

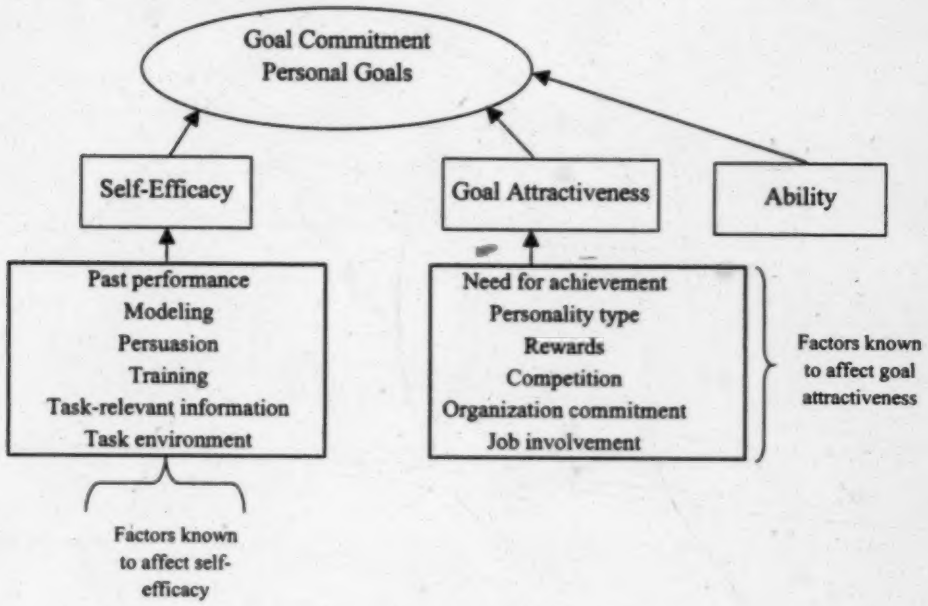
[1] "Supported" indicates significant effects found in primary analysis. "Partially supported" indicates significant effects found in supplementary analysis.
2 "Supported" indicates full or partial mediating effects were found.

Figure 1: The Moderating Role of Goal Intentions in the Goal Theory Framework[1]



[1] Hollenbeck and Klein (1987); Klein et al. (1999)

Figure 2: Determinants of Goal Commitment and Personal Goals[1]



[1] Hollenbeck and Klein (1987); Locke, Latham and Erez (1988)

Figure 3: Key SPMS Features Expected to Affect Goal Commitment Decisions

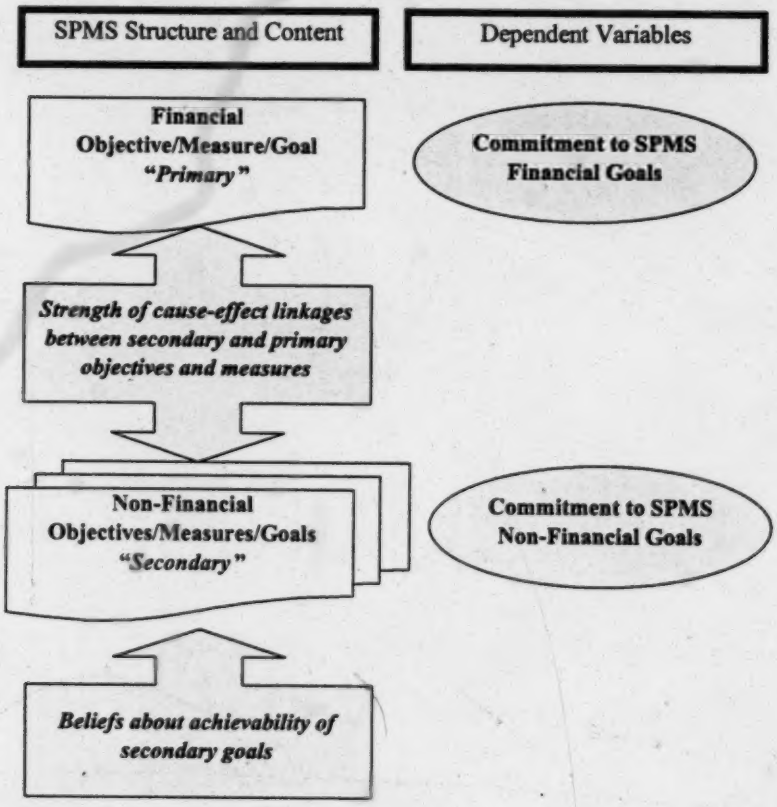
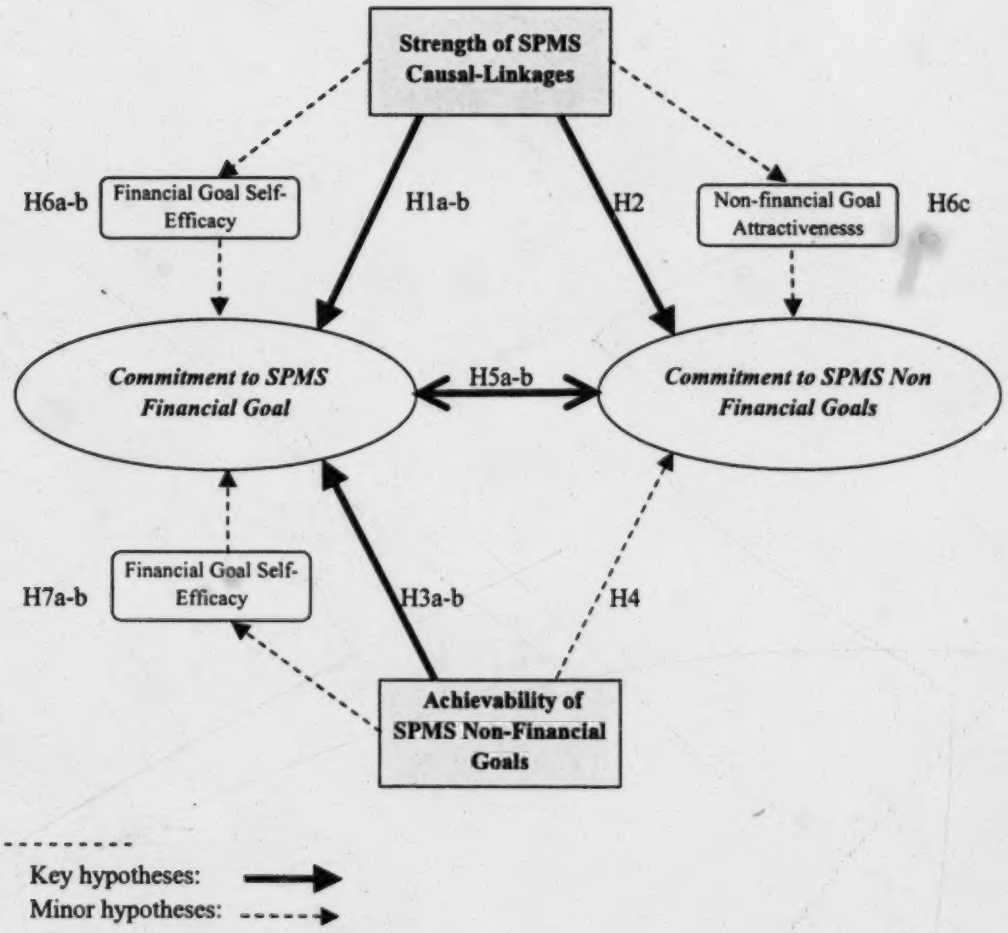

SPMS Structure and Content
Dependent Variables
Financial Objective/Measure/Goal "Primary"
Commitment to SPMS Financial Goals
Strength of cause-effect linkages between secondary and primary objectives and measures
Non-Financial Objectives/Measures/Goals "Secondary"
Commitment to SPMS Non-Financial Goals
Beliefs about achievability of secondary goals

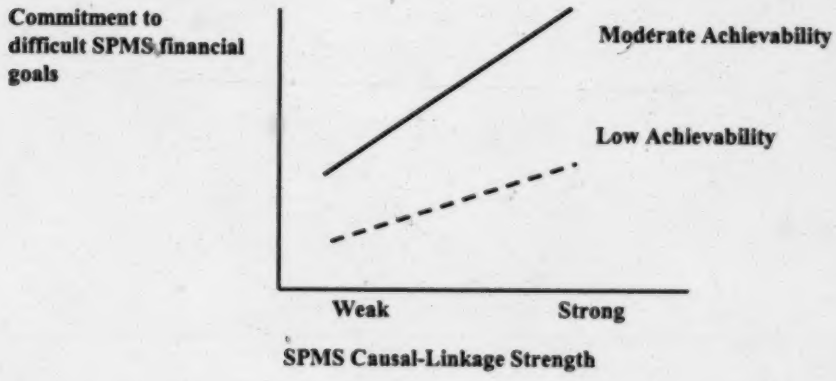
Figure 4: Summary of Hypotheses[1]



[1] All linkages in the model are positive.

Figure 5: Possible Interactive Effects of SPMS Features

Panel A: Financial Goal Commitment



Panel B: Non-Financial Goal Commitment

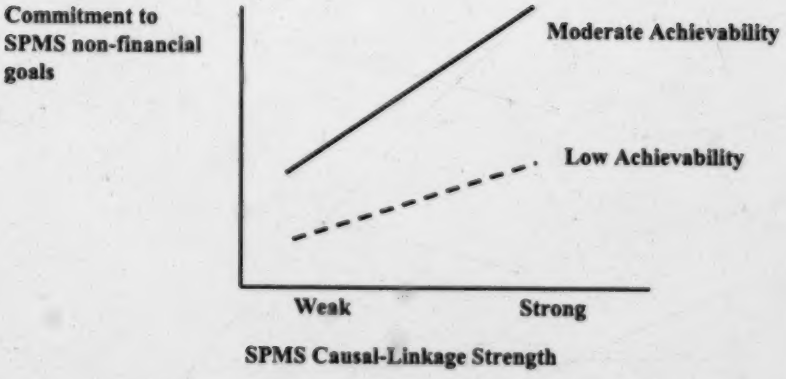


Figure 6: Summary of Key Experimental Design Features

		Within Subjects Factor: Strength of Causal-Linkages	
		Weak	Strong
Between subjects factor: Non-Financial Goal Achievability	Group A: Low Achievability	Case 1A	Case 2A
	Group B: Moderate Achievabilit	Case 1B	Case 2B

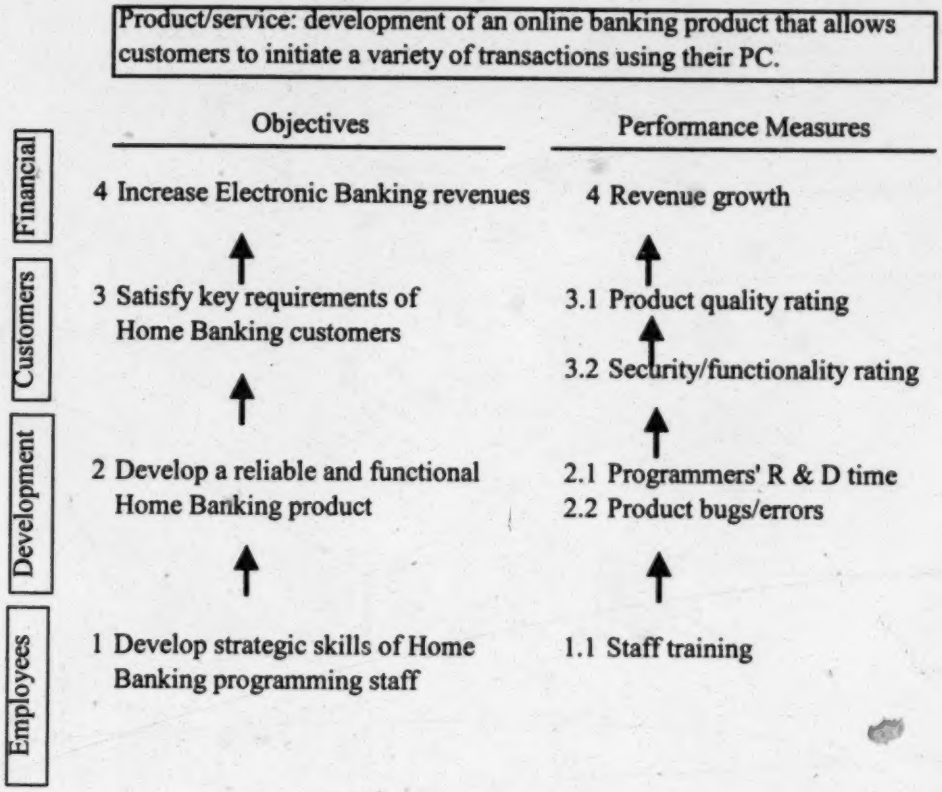
Dependent Variables:

1. Commitment to:
   a. Assigned SPMS financial goal
   b. Assigned SPMS non-financial goals
2. Personal goals for SPMS financial measures

Key Variables Measured:

1. Financial goal difficulty
2. Financial goal attractiveness
3. Financial goal self-efficacy
4. Non-financial goal difficulty
5. Non-financial goal attractiveness
6. Non-financial goal self-efficacy
7. Non-financial goal controllability
8. Strength of SPMS causal-linkages
9. Self-reported managerial ability
10. Understanding of reward system details

Figure 7: Strong Causal-Linkage SPMS[1]


Product/service: development of an online banking product that allows customers to initiate a variety of transactions using their PC.
Objectives
Performance Measures
Financial
Customers
Development
Employees
4 Increase Electronic Banking revenues
4 Revenue growth
3 Satisfy key requirements of Home Banking customers
3.1 Product quality rating
3.2 Security/functionality rating
2 Develop a reliable and functional Home Banking product
2.1 Programmers' R & D time
2.2 Product bugs/errors
1 Develop strategic skills of Home Banking programming staff
1.1 Staff training

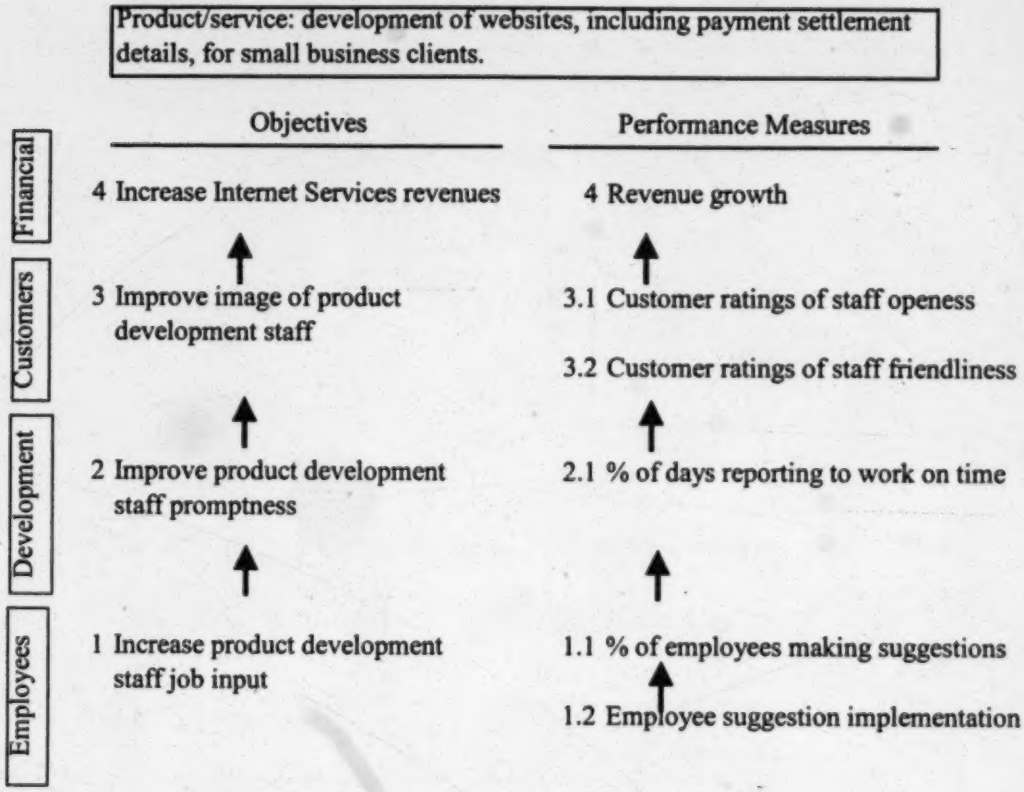
[1] The case materials identify the following for the participants:

Key Customer Values
System functionality
Security

Employee Requirements
Specialized programming skills available through training

↑ Arrows represent cause-effect relationships believed by management to be valid.

Figure 8: Weak Causal-Linkage SPMS[1]


Product/service: development of websites, including payment settlement details, for small business clients.
Objectives
Performance Measures
Financial
Customers
Development
Employees
4 Increase Internet Services revenues
4 Revenue growth
3 Improve image of product development staff
3.1 Customer ratings of staff openess
3.2 Customer ratings of staff friendliness
2 Improve product development staff promptness
2.1 % of days reporting to work on time
1 Increase product development staff job input
1.1 % of employees making suggestions
1.2 Employee suggestion implementation

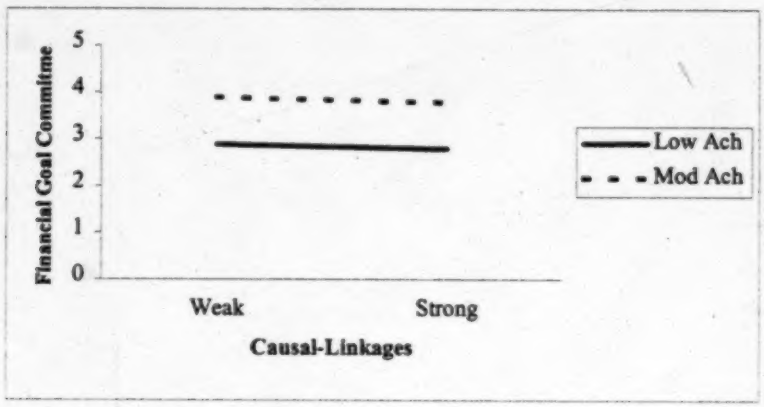
[1] The case materials identify the following for the participants:

Key Customer Values	Employee Requirements
Security of website and settlement transactions	Advanced training in website development and online settlement methods
Website appeal	

↑ Arrows represent cause-effect relationships believed by management to be valid.

Figure 9: Impact of Independent Variable Manipulations on Financial Goal Commitment, Personal Goals and Non-Financial Goal Commitment[1]

Panel A: Financial Goal Commitment



Panel B: Personal Goals for Financial Measures

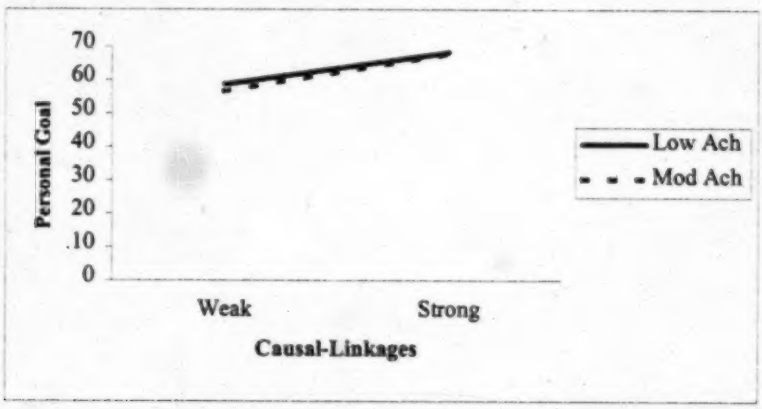
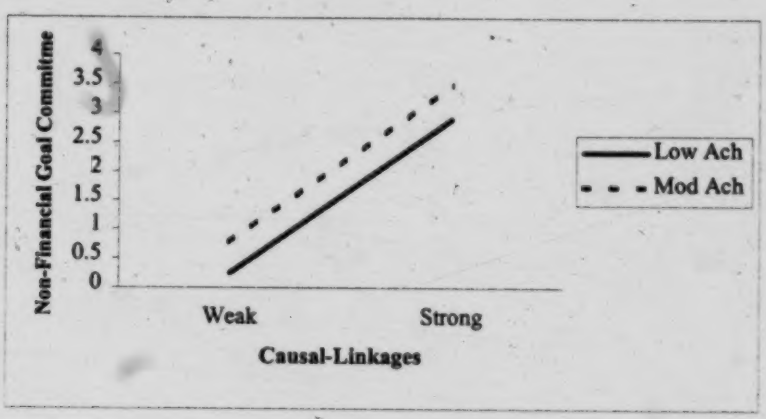


Figure 9 continued: Impact of Independent Variable Manipulations on Financial Goal Commitment, Personal Goals and Non-Financial Goal Commitment

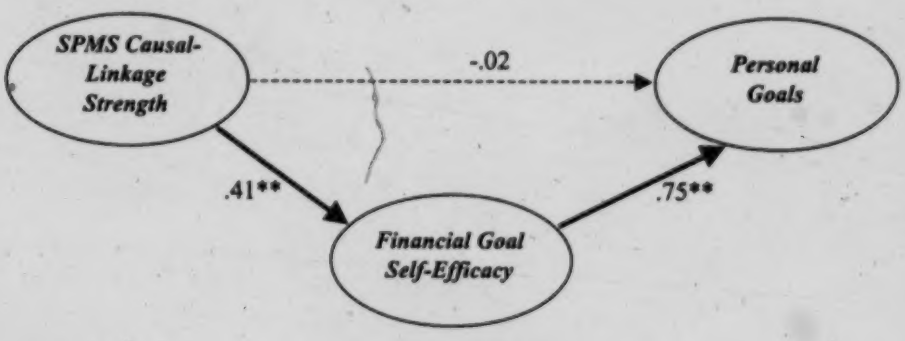
Panel C: Non-financial Goal Commitment



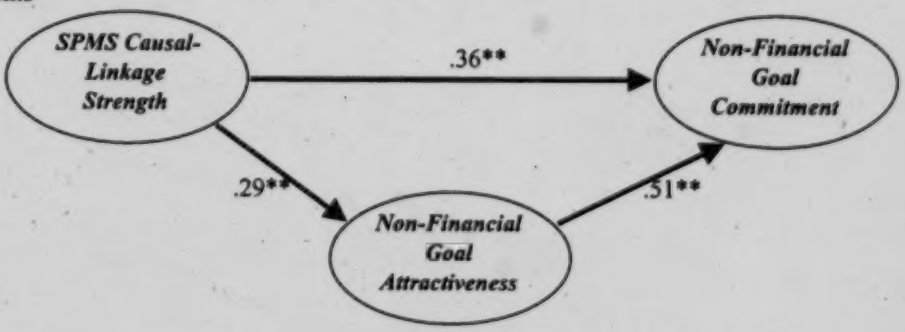
[1] "Low Ach": low achievability for non-financial goals; "Mod Ach": moderate achievability for non-financial goals. "Weak": weak causal-linkage SPMS case; "Strong": strong causal-linkage SPMS.

Figure 10: Path Analysis of the Within Ss Effects of SPMS Causal-Linkage Strength on Personal Goals and Non-Financial Goal Commitment[1]

Panel A: Direct and Indirect Links Between SPMS Causal-Linkage Strength and Personal Goals[2]



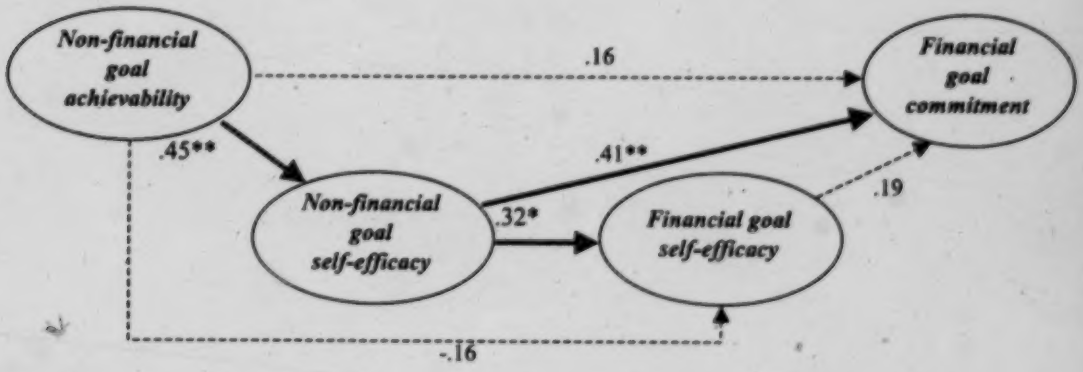
Panel B: Direct and Indirect Links Between SPMS Causal-Linkage Strength and Non-Financial Goal Commitment3



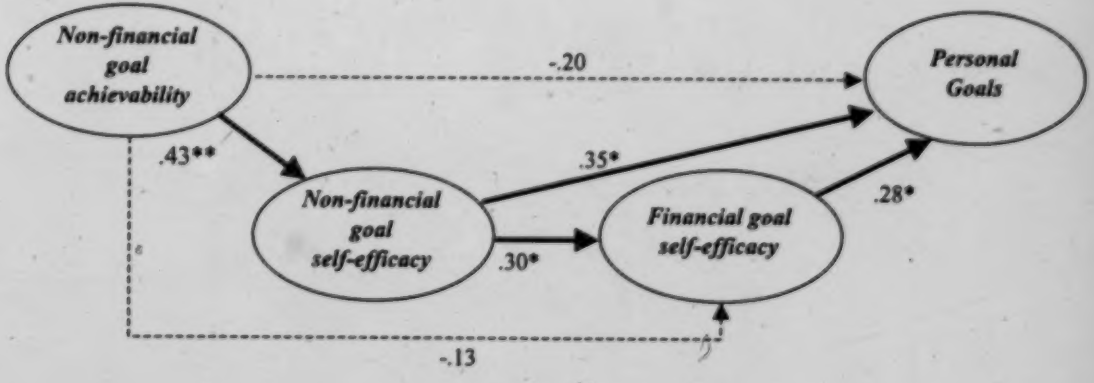
[1] Standardized beta coefficients are based on the regression analysis reported in Table 22. Bold (dashed) lines indicate significant (non-significant) paths.
[2] Total effect of SPMS causal-linkage strength on Personal Goals is .29** (Table 22, Panel A, Model 1).
[3] Total effect of SPMS causal-linkage strength on Non-Financial Goal Commitment is .51** (Table 22, Panel B, Model 1)
** $p < .01$

Figure 11: Path Analysis of the Between Ss Effects of Non-Financial Goal Achievability on Personal Goals and Financial Goal Commitment[1]

Panel A: Direct and Indirect Links Between Non-Financial Goal Achievability and Finacial Goal Commitment[2]



Panel B: Direct and Indirect Links Between Non-Financial Goal Achievability and Personal Goals[3]



[1] Standardized beta coefficients are based on the regression analysis reported in Table 23. Bold (dashed) lines indicate significant (non-significant) paths.

[2] Total effect of non-financial goal achievability (non-financial goal self-efficacy) on financial goal commitment is .34* (.47**) (Table 23, Panel A, Model 1; Table 20, Panel A).

[3] Total effect of non-financial goal achievability (non-financial goal self-efficacy) on personal goals is -.23 (.43**) (Table 23, Panel B, Model 1).

* $p < .05$, ** $p < .01$

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Appendix 1

EXPERIMENT INSTRUMENT

1

Introduction

First, thank you for taking the time to participate in this project.

New approaches to performance measurement have received considerable attention in the management accounting literature in recent years. However, very little is known about the implications of adopting non-traditional performance measurement systems. This study represents one of the first attempts to bridge this gap. It will provide valuable information about the reaction of managers, like you, to performance measurement systems.

2

What You're About To Do

You will be asked to assume a role in the two cases that follow.

The materials have been developed recognizing that the role you will play may not match your current responsibilities.

To navigate through the materials use the "Next Page" and "Previous Page" buttons that appear at the bottom of each page. Use the scroll bar that will appear on some pages to view all information within a page.

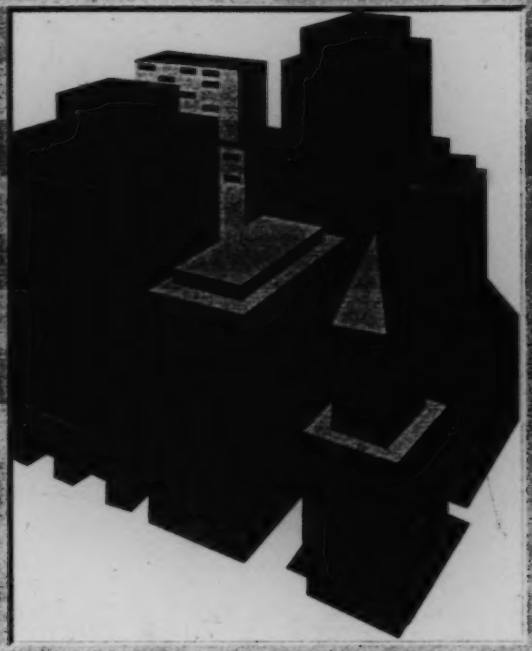
Please do NOT close the program once you have commenced working through the materials. Doing so will require you to start over from the beginning.

Completing the set of materials will be considered evidence of your consent to participate.

Please respond only on the basis of the information provided in the cases.

3

Eastern Canadian Bank: Case 1



4

Your Employer

You are employed by Eastern Canadian Bank (ECB)

ECB, incorporated 15 years ago, is a federally chartered bank serving Eastern Canada

As a federally chartered bank, ECB is able to provide full-service consumer and commercial banking to its clients

ECB serves primarily small to medium size clients who value personalized service

ECB is a public company, listed on the TSE

5

Your Role

You work in the Retail Banking Division of ECB.

You head up the Small Business E-Commerce Department (hereafter E-Commerce) which has been in existence for about three years.

E-Commerce assists small clients in setting up an online business by developing and maintaining their websites and providing them with credit card authorization and settlement services.

Clients are charged a monthly fee for the service provided by E-Commerce which ECB records as "Internet Services Fees".

It is now about 9 months into fiscal 2000.

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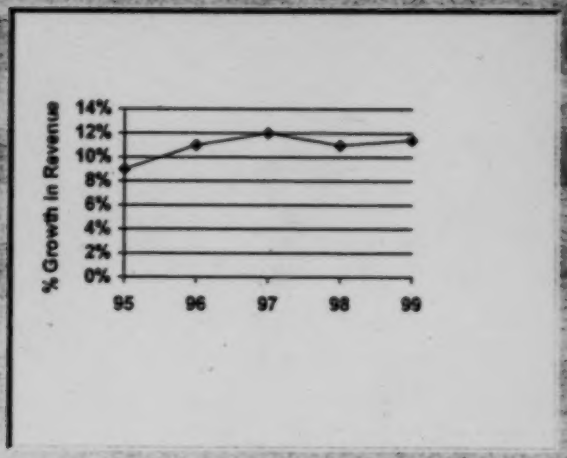
ECB Background: Revenue Growth



- Revenue represents Net Interest and Other Income before Non-Interest Expenses
- ECB has achieved consistent revenue growth, primarily through expansion of its branch network

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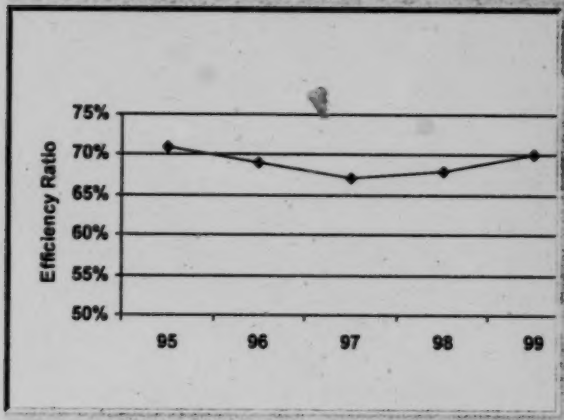
ECB Background: Efficiency Ratio



The Efficiency Ratio is a key measure of bank operating efficiency

Efficiency Ratio = Expenses/Total Revenues

Non-recurring items are removed from the numerator and

A high efficiency ratio is indicative of performance

ECB's Efficiency ratio has averaged .69 over the past five years

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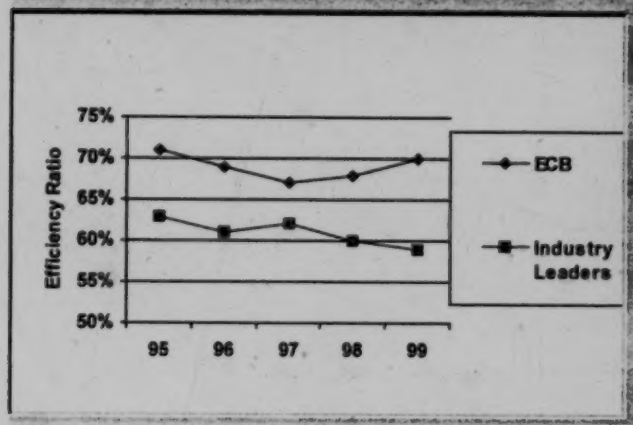
ECB Background: Efficiency Ratio



Leading financial institutions have shown steady improvement in operating efficiency over the past five years

The efficiency ratio for industry leaders has averaged .61 over the five-year period

This is nearly 12% better than ECB's .69 efficiency ratio

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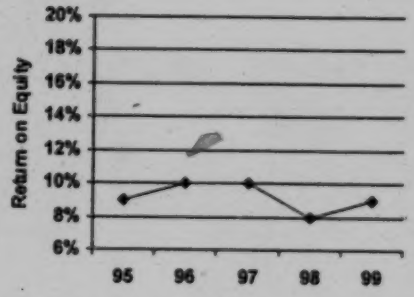
ECB Background: Return on Equity



ECB uses Return on Common Shareholder's Equity as a key measure of profitability

Over the past five years ECB has generated an average ROE of just over 9%

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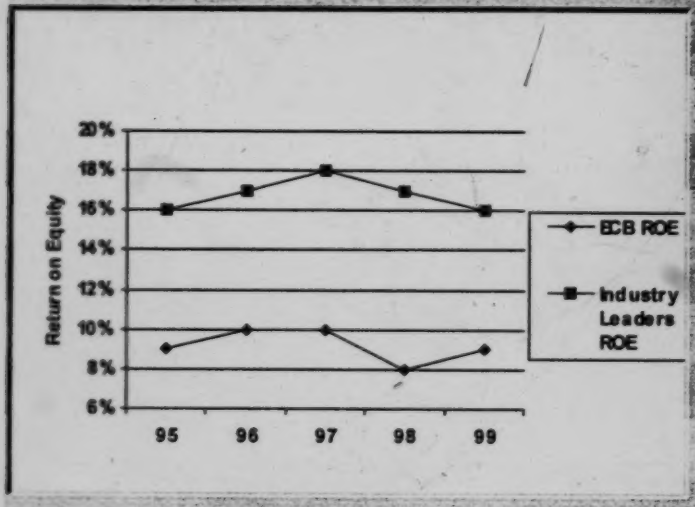
ECB Background: Return on Equity



Over the same five-year period the industry leaders have generated an average ROE of nearly 17%

This is nearly 85% higher than the average ROE generated by ECB from 1995-1999

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The Strategic Plan

Given the poor performance of ECB relative to industry leaders on measures of Efficiency and ROE, senior management has implemented a strategic plan

A key element of the strategic plan is to emphasize the development and delivery of cost effective products and services.

The specific strategic goals are:

Reduce the Efficiency Ratio to 60% by fiscal 2003

Increase ROE to 17% by fiscal 2003

Senior management recognizes achieving both goals will be very difficult but believes doing so will improve the competitive position of ECB

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12

The E-Commerce Plan

To implement the strategic plan, all divisions and departments at ECB must set objectives and goals that will contribute to achieving the 2003 Efficiency Ratio and ROE targets.

You have just learned that senior management of your division has established the following strategic objective for E-Commerce:

"To maximize the provision of E-Commerce services to existing and new ECB small business clients"

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The E-Commerce Plan

According to a recent customer survey, about one-third of ECB's small business clients are planning to start selling their products and services on-line in the next 2-3 years.

The same survey indicates these clients will require the services of E-Commerce, or your competitors, in setting up and maintaining all aspects of their website.

Your division's senior management has proposed a goal of increasing the number of E-Commerce clients by 50% in both fiscal 2001 and fiscal 2002 compared to the 2000 client base. This would result in an annualized increase of Internet Services revenue of 100% by 2003.

Senior management recognizes that it will take some time to implement the initiatives necessary to achieve the growth in the client base. Because of this they expect some growth in Internet Services revenues in 2001 but a significant increase will not be realized until 2002.

For 2002, senior management has proposed a goal of increasing Internet Services revenue by 75%.

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E-Commerce: Achieving the Goal

Feedback from existing E-Commerce customers indicates improvements to the product are needed if the revenue growth goal is to be achieved.

There are two major areas of customer concern with the existing product

- the functionality and appeal of the website design
- security of the credit card authorization and settlement feature

Management's key assumptions in assigning you the

- no change to the monthly "Internet Services" fee per client
- an increase of 50% in the client base can be achieved by the end of fiscal 2001 (about 15 months from now) most of which will occur in the latter portion of the year
- a further increase of 50% in the client base in fiscal 2002 occuring evenly throughout the year

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Sizing it Up

It's standard practice at ECB to rate the difficulty of performance goals

You have considered several issues in forming your assessment of the difficulty of increasing Internet Services Revenue by 75% in 2002:

- COMPETITION: ECB's competition comes from other small regional banks and credit unions who are developing and delivering similar services targeted at the same small business clients who want the personalized service of a smaller financial institution. While the total online commerce market is large, ECB is competing for a limited share.

- DEMAND: some small business clients may decide not to opt for online commerce

- PRODUCT: product enhancements may take more time than anticipated

- INDUSTRY BENCHMARKS: the planned revenue growth is comparable to that achieved by industry leaders offering a similar service

Your assessment is shown below on the scale used at ECB to rate the difficulty of goals.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☑ 9 ☐ 10

very easy very hard

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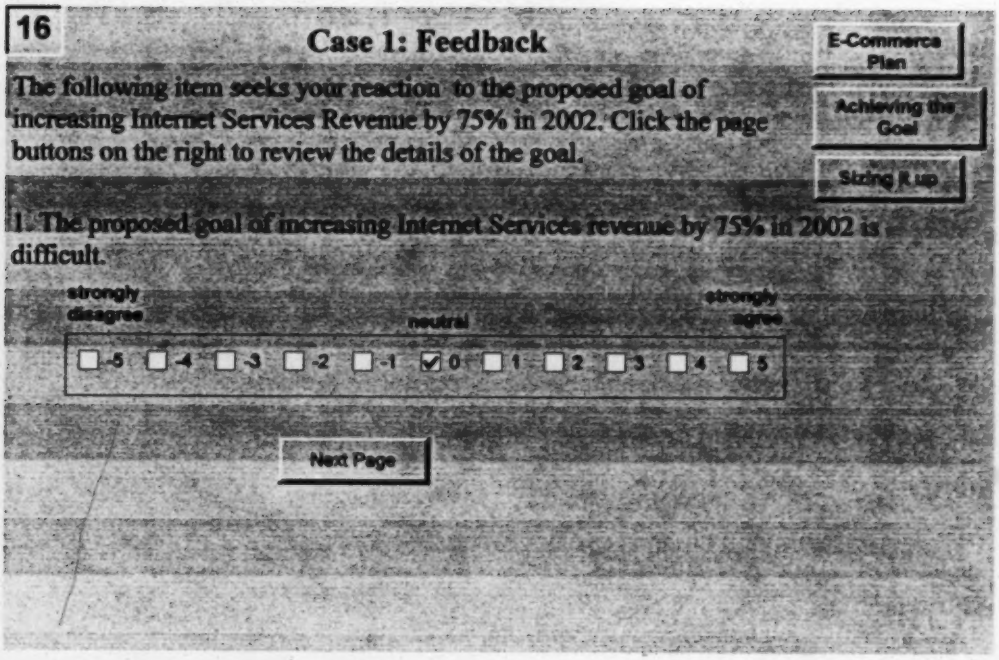
16
Case 1: Feedback
E-Commerce Plan
Achieving the Goal
Sizing It up
The following item seeks your reaction to the proposed goal of increasing Internet Services Revenue by 75% in 2002. Click the page buttons on the right to review the details of the goal.
1. The proposed goal of increasing Internet Services revenue by 75% in 2002 is difficult.
strongly disagree
neutral
strongly agree
-5 -4 -3 -2 -1 0 1 2 3 4 5
Next Page

Strategic Performance Management

Retail Banking senior management has developed a Strategic Performance Management System (SPMS).

The SPMS is intended to support the strategic goals of ECB

- Identifying key non-financial factors management believes will affect the ability of E-Commerce to reach its financial goals in the coming years
- Establishing performance measures for those non-financial factors
- Setting goals for the non-financial performance measures for fiscal 2001 that are intended to result in achievement of the proposed goal of increasing Internet Services revenue by 75% in fiscal 2002

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SPMS: Customer Values

Your review of E-Commerce customer satisfaction surveys and focus group feedback indicates they have two major areas of concern with the current service:

- SECURITY: many customers are dissatisfied with the security features for credit cards and other online settlement details.
- WEBSITE APPEAL: many customers are dissatisfied with their website in terms of its functionality, ease-of-use and attractiveness.

Feedback shows customers have been lost because of the level of their dissatisfaction in one or both of these areas.

You believe the goal of increasing Internet Services revenue cannot be achieved unless the quality of both the security features and website design are improved.

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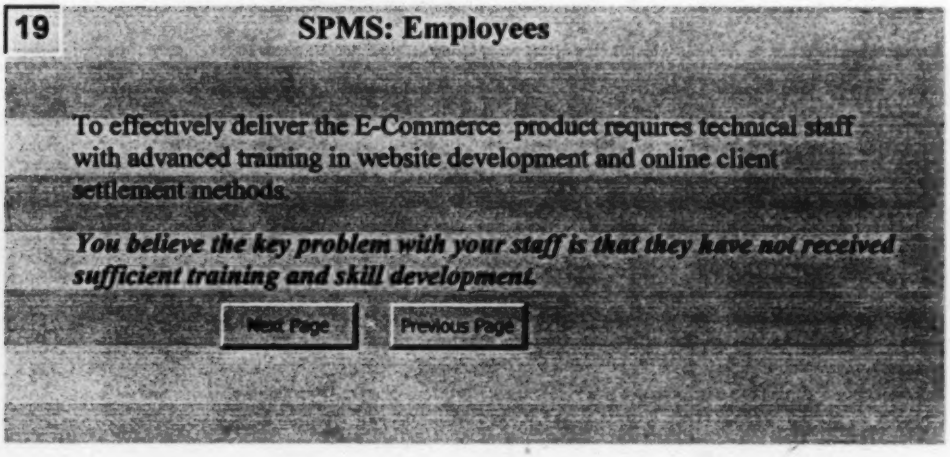
19
SPMS: Employees
To effectively deliver the E-Commerce product requires technical staff with advanced training in website development and online client settlement methods.
You believe the key problem with your staff is that they have not received sufficient training and skill development.
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SPMS: Details

The next few slides present the SPMS proposed by Retail Banking management for E-Commerce

To aid your understanding:

- the SPMS is "built" sequentially by key factors: Employees; Development Processes; Customer; and Financial
- objectives, measures and goals are identified for each key factor
- "pop-up" windows are used to explain performance measures where necessary. Place your pointer over a performance measure to see its definition. Where helpful, some performance goals are also defined using pop-up windows.
- "Cause-effect" links among objectives and measures are indicated with an upward arrow. All relationships are positive in nature.

Please proceed carefully through each slide

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SPMS: Employees

	Objectives	Performance Measures	2001 Goals	Rating
Employees	1. Increase product development staff job input	1.1 % of employees making suggestions 1.2 Employee suggestion implementation	75% 60%	

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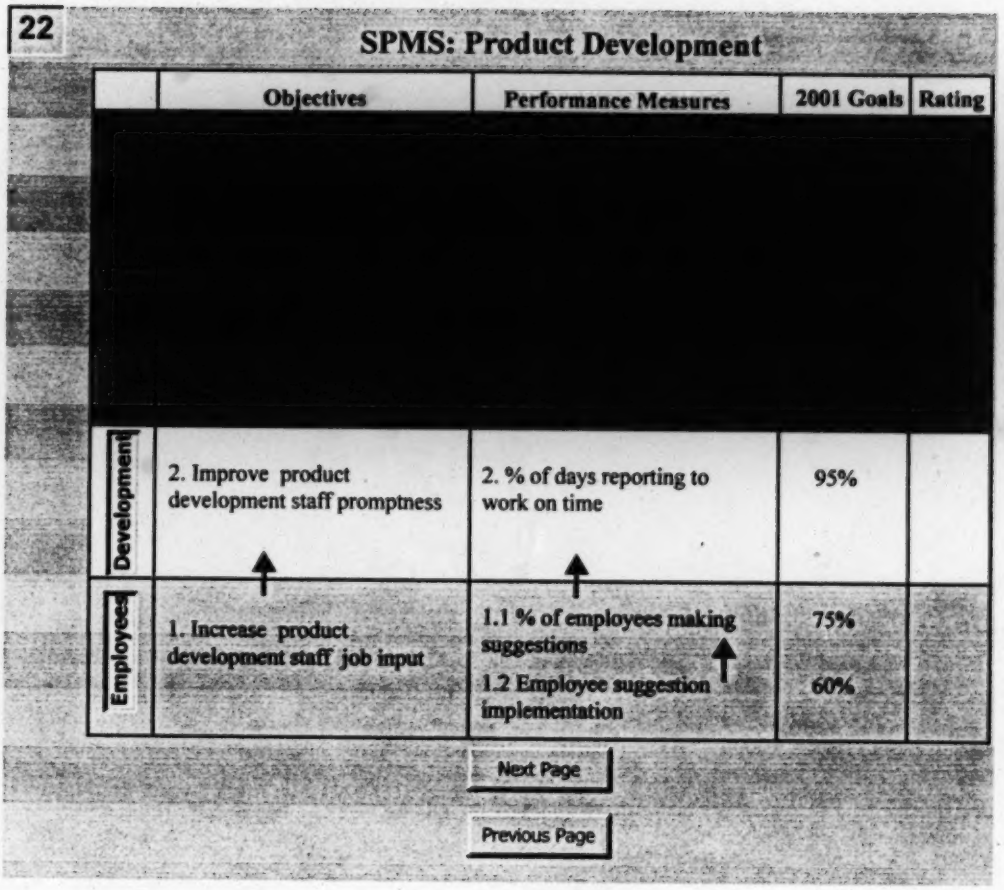
22
SPMS: Product Development
Objectives
Performance Measures
2001 Goals
Rating
Development
2. Improve product development staff promptness
2. % of days reporting to work on time
95%
Employees
1. Increase product development staff job input
1.1 % of employees making suggestions
1.2 Employee suggestion implementation
75%
60%
Next Page
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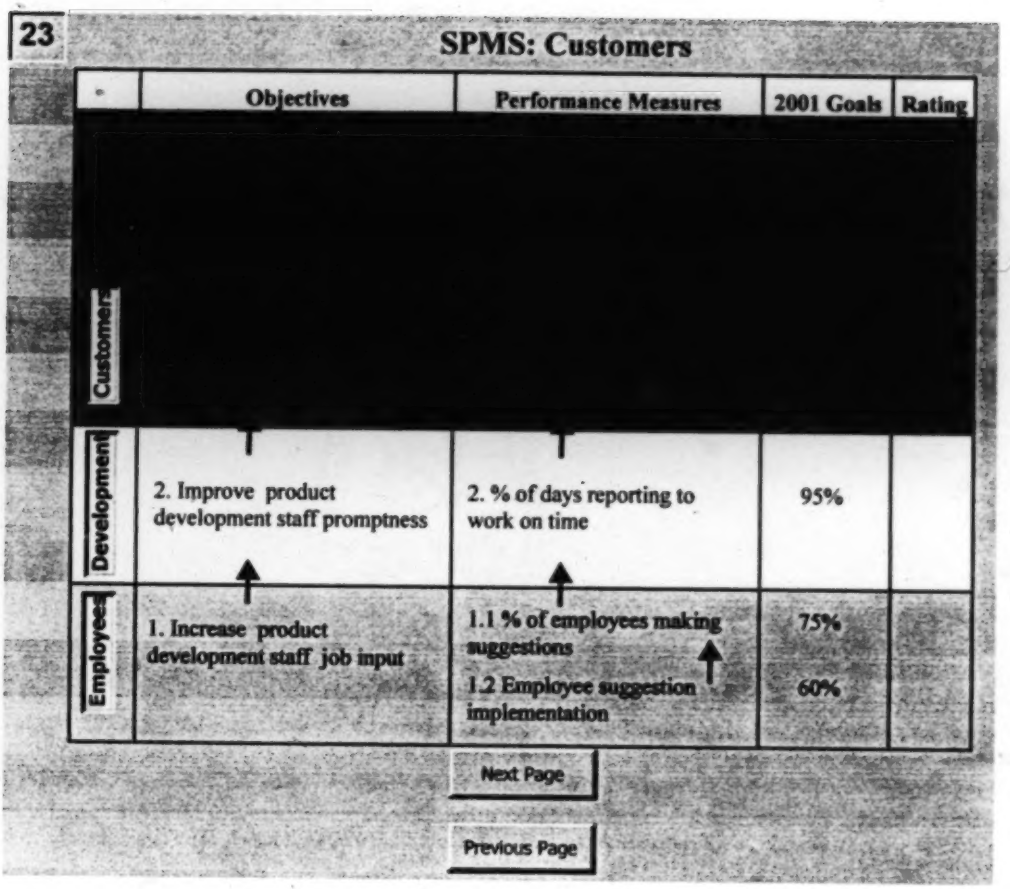
23
SPMS: Customers
Objectives
Performance Measures
2001 Goals
Rating
Customers
Development
2. Improve product development staff promptness
2. % of days reporting to work on time
95%
Employees
1. Increase product development staff job input
1.1 % of employees making suggestions
75%
1.2 Employee suggestion implementation
60%
Next Page
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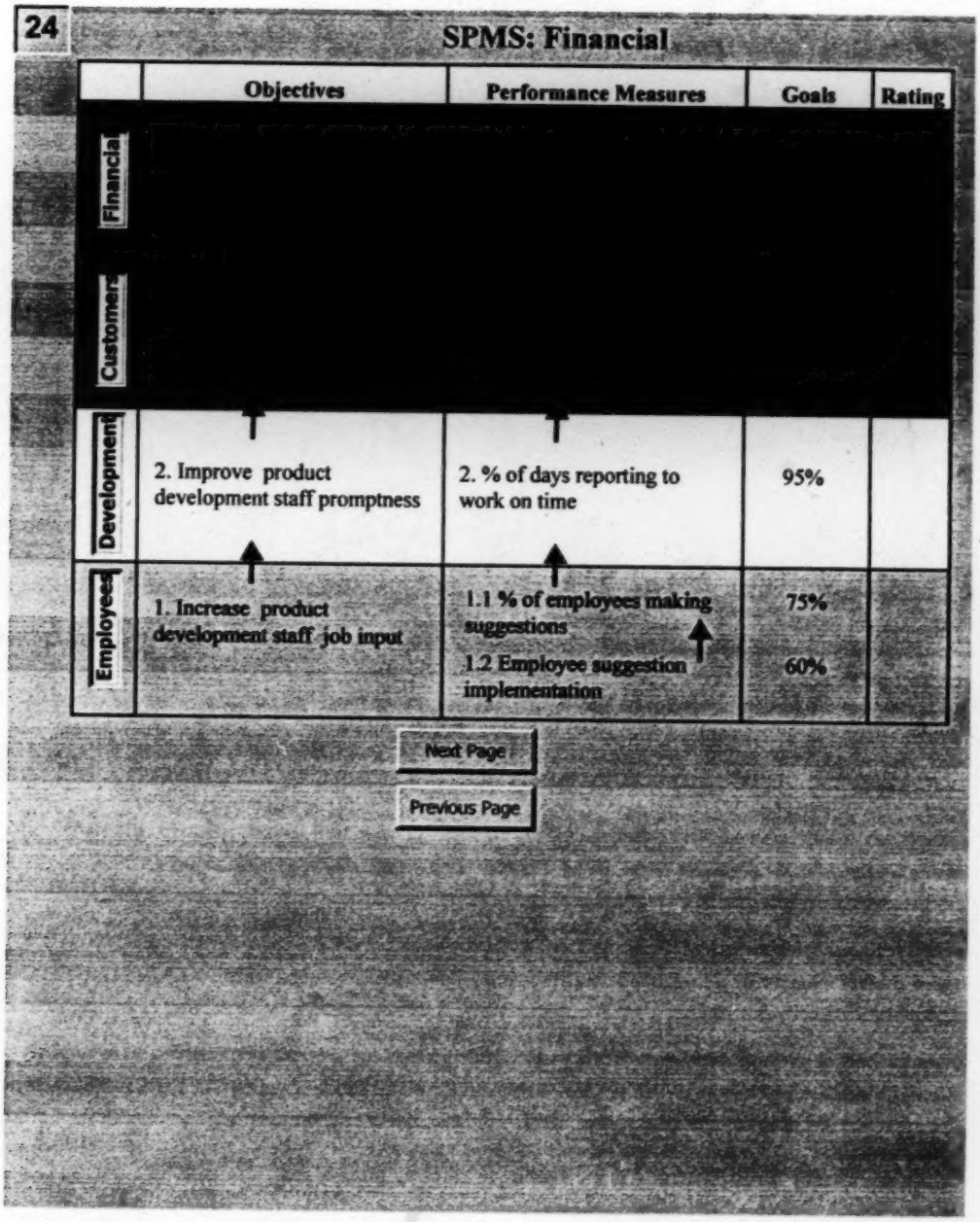
24
SPMS: Financial
Objectives
Performance Measures
Goals
Rating
Financial
Customer
Development
2. Improve product development staff promptness
2. % of days reporting to work on time
95%
Employees
1. Increase product development staff job input
1.1 % of employees making suggestions
75%
1.2 Employee suggestion implementation
60%
Next Page
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Case 1: Feedback Part 1

The following items are based on the SPMS presented on Page 24. Please refer to that slide as necessary.

Each statement refers to the SPMS cause-effect relationships management has proposed on page 24.

Based on the facts presented in this case, please indicate whether you think each of the cause-effect relationships proposed in the SPMS is plausible for ECB by ticking one of the boxes.

Place your pointer over the response boxes in the first row to see a description of what each means.

1. According to the Objectives identified in the proposed SPMS: SPMS Page 24

a. Increasing product development staff job input will improve their promptness. ☐ Agree ☐ Disagree ☐ Not Sure

b. Improving product development staff promptness will improve their image with customers. ☐ Agree ☐ Disagree ☐ Not Sure

c. Improving the image of product development staff with customers will lead to increased Internet Services ☐ Agree ☐ Disagree ☐ Not Sure

2. According to the Performance Measures identified in the proposed SPMS:

a. Implementing employee suggestions will result in more product development staff submitting suggestions. ☐ Agree ☐ Disagree ☐ Not Sure

b. Increasing the percentage of employees who submit suggestions will result in fewer late arrivals for work. ☐ Agree ☐ Disagree ☐ Not Sure

c. Fewer late arrivals for work will improve customer ratings of product development staff openess and friendliness. ☐ Agree ☐ Disagree ☐ Not Sure

d. Improving customer ratings of product staff openess and friendliness will lead to increased Internet Services revenue. ☐ Agree ☐ Disagree ☐ Not Sure

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SPMS: Non-Financial Goal Difficulty

The 2001 goals for the non-financial performance measures shown on page 24 have been proposed by Retail Banking senior management.

Senior management believes achieving these non-financial goals will lead to the goal of increasing Internet Services revenue by 75% in 2002.

You have considered several factors in rating the difficulty of these goals including: time demands, uncertain customer demand and employee expertise requirements.

You have also reviewed industry benchmarks for performance on each measure. Your data indicates the assigned goals represent performance achieved by industry leaders.

The goal difficulty ratings shown on the next page are based on the scale below:

1 2 3 4 5 6 7 8 9 10

very easy very hard

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27

SPMS: Goal Difficulty Ratings

	Objectives	Performance Measures	Goals	Rating
Financial				
Customers				
Development	2. Improve product development staff promptness	2. % of days reporting to work on time	95%	9
Employees	1. Increase product development staff job input	1.1 % of employees making suggestions	75%	9
		1.2 Employee suggestion implementation	60%	9

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Non-Financial Goals: Achievability

You now assess the likelihood of achieving each of the non-financial SPMS goals (excluding the revenue increase goal).

You begin your assessment by estimating the gap between this year's projected performance and the goal for next year on each non-financial measure. These estimates are shown on the next page.

In deciding whether the non-financial goals can be met you consider:

- Controllability of factors affecting goal attainment
- Time constraints
- Availability of resources necessary to achieve the goals

Based on your previous experience with achieving performance goals at ECB, you believe you have a 60% probability of attaining each of the non-financial SPMS goals proposed by management

The next page presents the proposed SPMS with the goal achievability information included. Place your pointer over the column headings for a description of each. As before, other goals and measures are defined with pop-up windows.

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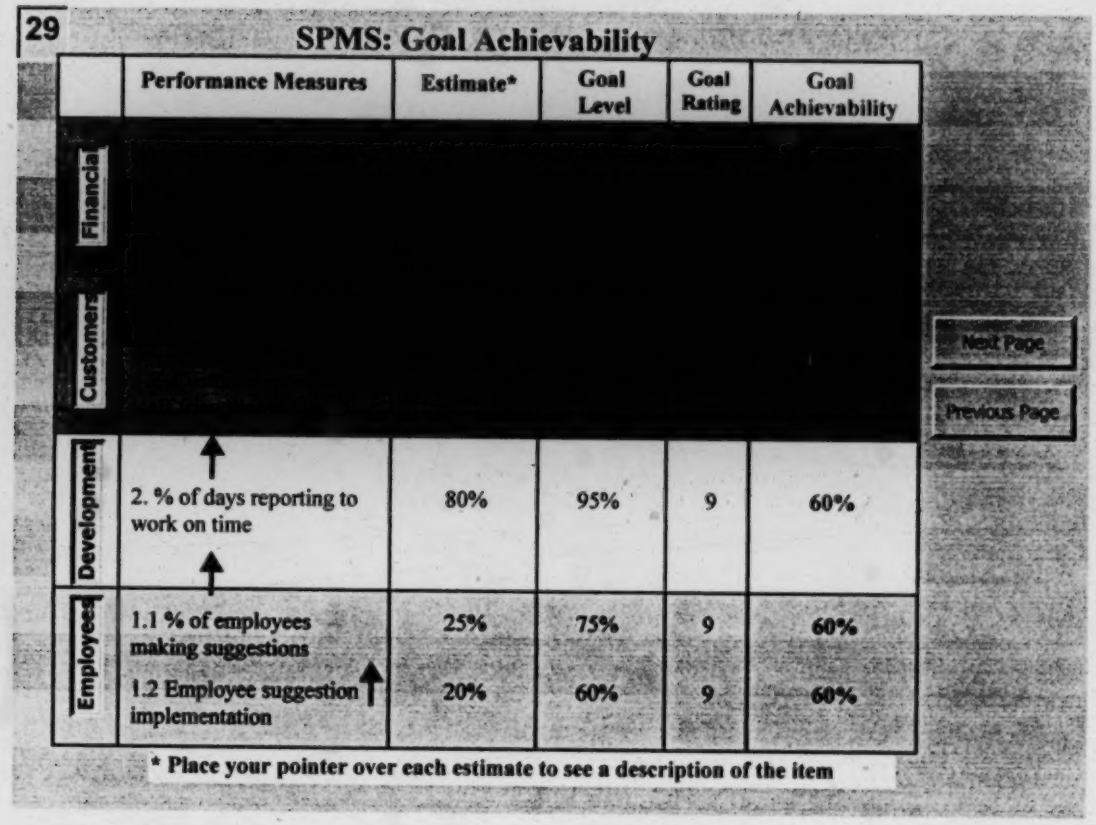
29
SPMS: Goal Achievability
Performance Measures
Estimate*
Goal Level
Goal Rating
Goal Achievability
Financial
Customer
Development
2. % of days reporting to work on time
80%
95%
9
60%
Employees
1.1 % of employees making suggestions
25%
75%
9
60%
1.2 Employee suggestion implementation
20%
60%
9
60%
Next Page
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* Place your pointer over each estimate to see a description of the item

30 SPMS: The Rewards

The strategic goal of ECB is to make considerable gains in efficiency and ROE. As a result, senior management has established an incentive plan that emphasizes financial performance.

Your performance evaluation will be directly influenced by your success in achieving the "Internet Services" revenue growth goal. The strength of your performance evaluation will have a significant impact on your annual bonus.

So for 2002, if you do not achieve the revenue growth goal of 75%, your performance evaluation and bonus will be negatively affected.

Performance on non-financial SPMS goals will be indirectly rewarded to the extent that they lead to achievement of the financial goal.

Bonuses available to top performers at ECB are significant.

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Case 1: Feedback Part 2

The following statements are based on the proposed SPMS presented on Page 27. You may find it useful to review page 27 at this time. You may also find it useful to review the statement of customer values and the employee skill necessary to deliver on those values.

Customer Values | Employee Skills | SPMS Page 27

1. The SPMS identifies non-financial Objectives that should lead to the objective of increasing Internet Services revenue.

strongly disagree — neutral — strongly agree

-5 -4 -3 -2 -1 0 1 2 3 4 5

2. The SPMS identifies a set of non-financial Performance Measures that should lead to the goal of increasing Internet Services revenue by 75% in 2002.

strongly disagree — neutral — strongly agree

-5 -4 -3 -2 -1 0 1 2 3 4 5

3. How strong would you rate the link between performance on the non-financial measures identified in the proposed SPMS and growth in Internet Services revenues?

Very Weak — Very Strong

1 2 3 4 5 6 7

4. How controllable do you believe the set of non-financial performance measures is (i.e. how much influence do you believe you would have on the outcomes)?

Not at all controllable — Very controllable

1 2 3 4 5 6 7

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Case 1: Feedback Part 3

The following questions relate to the proposed SPMS presented on page 29. You may find it useful to review page 29 at this time.

SPMS Page 29

1. The proposed 2001 goals for the set of non-financial Performance Measures (excluding the Internet Services revenue goal) are difficult.

strongly disagree — neutral — strongly agree

-5 -4 -3 -2 -1 0 1 2 3 4 5

2a. Do you believe the proposed 2001 goals for the set of non-financial Performance Measures (excluding the Internet Services revenue goal) can be achieved?

Yes No

2b. Please indicate your estimate of the probability of achieving the set of 2001 non-financial performance goals:

%

3. Given the reward system in place at ECB, please indicate how attractive it would be for you to achieve the 2001 goals for the set of non-financial performance measures proposed by management? (remember these non-financial goals have been proposed because management believes they will lead to attainment of the revenue growth goal)

You may find it helpful to review the details of ECB's reward system.

Rewards

very unattractive — neutral — very attractive

-5 -4 -3 -2 -1 0 1 2 3 4 5

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Case 1: Feedback Part 4

The following items seek your reactions to the goals for the proposed set of non-financial Performance Measures on Page 29.

When responding, remember these non-financial performance measures and goals have been proposed by management because they believe they will lead to the financial goal of increasing Internet Services revenues by 75% in 2002. However, you are encouraged to express your views as to their appropriateness.

SPMS Page 29

1. I would care if I achieved the goals for the proposed set of non-financial Performance Measures

strongly disagree — neutral — strongly agree

-5 -4 -3 -2 -1 0 1 2 3 4 5

2. It would take a lot to make me abandon the goals for the proposed set of non-financial Performance Measures.

strongly disagree — neutral — strongly agree

-5 -4 -3 -2 -1 0 1 2 3 4 5

3. I think the goals for the proposed set of non-financial Performance Measures would be good goals to strive for.

strongly disagree — neutral — strongly agree

-5 -4 -3 -2 -1 0 1 2 3 4 5

4. I would be strongly committed to pursuing the goals for the proposed set of non-financial Performance Measures.

strongly disagree — neutral — strongly agree

-5 -4 -3 -2 -1 0 1 2 3 4 5

5. I would be willing to put in a great deal of effort to achieve the goals for the proposed set of non-financial Performance Measures.

strongly disagree — neutral — strongly agree

-5 -4 -3 -2 -1 0 1 2 3 4 5

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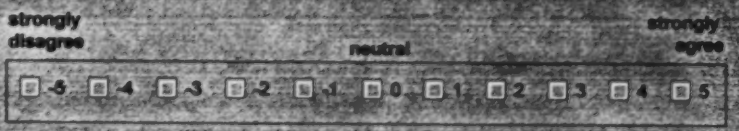
Case 1: Feedback Part 5

On the previous page you responded to a series of questions about the proposed goals for the set of non-financial performance measures. Now your reactions to the proposed financial goal of increasing Internet Services revenue by 75% in 2002 are being sought.

Responses should be based only on the case information and your assessment of the usefulness of the proposed SPMS in achieving the goal. Again you are reminded that the revenue growth goal for 2002 has only been proposed by management and you are encouraged to express your views as to its appropriateness.

1. I would care if I achieved the goal of increasing Internet Services revenue by 75%.

2. It would take a lot to make me abandon the goal of increasing Internet Services revenue by 75%.



3. I think the goal of increasing Internet Services revenue by 75% would be a good goal to strive for.

4. I would be strongly committed to pursuing the goal of increasing Internet Services revenue by 75%.

5. I would be willing to put in a great deal of effort to achieve the goal of increasing Internet Services revenue by 75%.

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Case 1: Feedback Part 5 continued

6. If I were to use the proposed SPMS to manage the E-Commerce department, I believe Internet Services revenues could be increased in 2002 by:

		Indicate your estimate of the % probability of achieving each goal level (0-100):
a. 45%	☐ Yes ☐ No	____ %
b. 55%	☐ Yes ☐ No	____ %
c. 65%	☐ Yes ☐ No	____ %
d. 75%	☐ Yes ☐ No	____ %
e. 85%	☐ Yes ☐ No	____ %

7. Based on the information presented in the case, I believe the goal of increasing Internet Services revenue in 2002 should be set at:

☐ 35% ☐ 45% ☐ 55% ☐ 65% ☐ 75% ☐ 85% ☐ 95% Other: Please specify ____ %

8. Given the reward system used at ECB, please indicate how attractive you think it would be to achieve the goal of increasing Internet Services revenue by 75% in 2002.

very unattractive — neutral — very attractive

☐ -5 ☐ -4 ☐ -3 ☐ -2 ☐ -1 ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

9. Your bonus for fiscal 2002 at ECB will be directly affected by your success in achieving the 75% increase in Internet Services revenue.

strongly disagree — neutral — strongly agree

☐ -5 ☐ -4 ☐ -3 ☐ -2 ☐ -1 ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

10. Performance on non-financial measures is rewarded at ECB to the extent they contribute to achievement of the financial goals.

strongly disagree — neutral — strongly agree

☐ -5 ☐ -4 ☐ -3 ☐ -2 ☐ -1 ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

YOU HAVE NOW COMPLETED ALL REQUIREMENTS FOR CASE 1. ON THE NEXT PAGE YOU WILL BE ASKED A FEW QUESTIONS ABOUT YOUR BACKGROUND AND THE COMPANY YOU WORK FOR. PLEASE PROCEED.

Background Questions

36

Background Information

Please provide the following information about your background:

1. Number of years full-time work experience: 1

2. Number of years with current employer: 1

3. Number of employees reporting to you in your current position 1

4. Highest level of education: Undergraduate Degree

5. Job title: Manager

6. Industry of your current employer:

- (•) Manufacturing
- ( ) Natural Resources
- ( ) Retail
- ( ) Transportation
- ( ) Telecommunications
- ( ) Information Technology
- ( ) Banking
- ( ) Insurance
- ( ) Other Financial Services
- ( ) Utilities
- ( ) Other

7. Approximately how many people does your company employ? (Do not use a comma. If you are unable to answer please enter "0".) 12

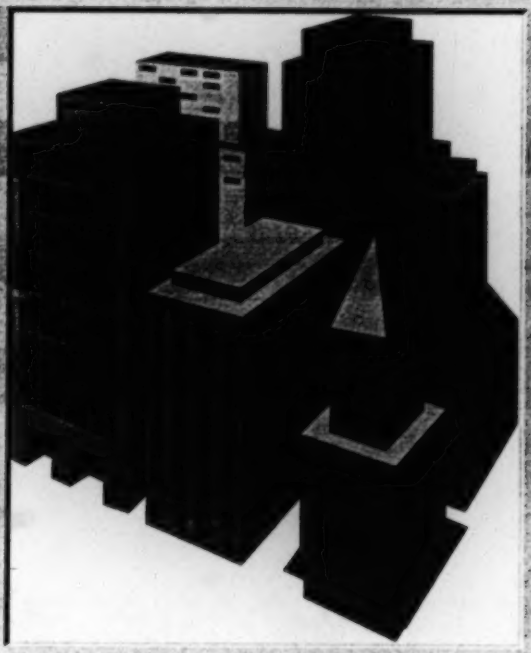
8. Approximately what is your company's total annual revenue? (Do not use a comma, decimal place or dollar sign. If you are unable to answer please enter "0".) 14

9. Approximately what is the total of your company's balance sheet assets? (Do not use a comma, decimal place or dollar sign. If you are unable to answer please enter "0".) 16

Thanks for providing these details about your background! Please click the button below to proceed to Case 2.

Case 2

Eastern Canadian Bank: Case 2



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ECB: Case 2

In this case you head up a different department at ECB: "Home Banking".

The basic background information about ECB, presented in pages 4, and 6-11, remains the same.

If you like, use the buttons below to review those pages.

Your Employer | Revenue Growth | Efficiency Ratio 1 | Efficiency Ratio 2 | ROE 1 | ROE 2 | Strategic Plan

The format for presenting the information in Case 2 is similar to Case 1as are the questions you will be responding to. However there are major differences in Case 2 and they are as follows:

-You are in charge of a different product in a different department at ECB.

-Your new department has a different strategic objective.

-The SPMS for your new department contains different objectives, performance measures and goals.

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ECB: Home Banking

Home Banking is part of the Retail Banking division of ECB.

The Home Banking group is responsible for developing and implementing electronic banking services customers can access from their personal computers.

Home Banking has only been in operation for a few years and is just beginning to fulfill its mandate.

ECB is about 9 months into fiscal 2000.

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The Home Banking Plan

As before, all divisions and departments at ECB set annual objectives and goals that will contribute to achieving the 2003 Efficiency Ratio and ROE targets.

Senior management of Retail Banking has established the following strategic objective for Home Banking:

> "To develop and deliver electronic transaction services that will be of value to our customers".

"Electronic transactions" are those transactions a customer can initiate by phone or personal computer without requiring ECB staff involvement.

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Electronic Banking Product: Background

The Retail Banking division of ECB offers very limited electronic transactions services beyond customer debit cards and ATM machines.

The Electronic Banking product currently offered consists solely of a telephone banking system.

The telephone banking system was implemented in Retail Banking about two years ago. Key features of the system are:

- Customers can perform account inquiries and funds transfers from touch-tone phones
- Customers pay a fixed monthly fee as part of their service charge package

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Electronic Banking Product: Problems

Division management has been disappointed with customer response to the Electronic Banking product. Only 30% of existing customers have purchased the telephone banking product.

Feedback from customer surveys and focus groups indicates that 60% of ECB's retail banking customers have a personal computer.

These customers want to be able to initiate transactions online using their PC, a service now offered by most of the leading banks in Canada.

Given this customer demand, Retail Banking management has decided to offer an improved Electronic Banking product. The enhanced product will expand the services of the existing telephone banking system and will allow customers to perform a variety of "online" transactions through their personal computers: "PC Banking"

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Electronic Banking Product: The Goal

Division management has given your group the responsibility of developing and delivering an improved Electronic Banking product.

Division management has proposed a goal for Home Banking of increasing the number of customers who purchase the Electronic Banking

- 25% in fiscal 2001 (versus 2000)
- 100% in 2002 (versus 2000)

Because it will take time to develop the PC Banking system, senior management anticipates substantial increases in Electronic Banking fee revenues will not occur until fiscal 2002.

Division management has proposed a goal of increasing Electronic Banking fee revenues by 75% in 2002 versus 2000.

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Goal Assumptions

Division management's key assumptions in setting the proposed goal:

- No change in the fixed monthly fee currently charged for the Electronic Banking product.
- The 25% increase in the customer base in fiscal 2001 will occur toward the end of the year.
- The 100% increase in the customer base in fiscal 2002 will occur evenly throughout the year.

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Assessing the Goal

You've formed a preliminary assessment of management's proposed goal of increasing Electronic Banking revenue by 75% in fiscal 2002

In assessing the difficulty of increasing Electronic Banking revenue 75% in 2002 you considered:

- INDUSTRY DATA: the revenue growth of 75% is similar to the performance attained by leading financial institutions early in the development of PC Banking

- PRODUCT DEVELOPMENT: PC Banking system development will require your staff to develop specialized programming skills

- COMPETITION: customers may opt to transfer their business to other small regional banks or credit unions who are also rapidly developing PC Banking capabilities

Your assessment is shown below on the scale used at ECB to rate the difficulty of performance goals.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☑ 9 ☐ 10

very easy very hard

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Case 2: Feedback

The following item seeks your reaction to the proposed goal of increasing Electronic Banking revenue by 75% in 2002. Click the page buttons below to review the details of the goal.

The Goal | Goal Assumptions | Assessing the Goal

1. The proposed goal of increasing Electronic Banking revenue by 75% in 2002 is difficult.

strongly disagree — neutral — strongly agree

-5 -4 -3 -2 -1 0 1 2 3 4 5

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The Performance Management System

Retail Banking management has developed a Strategic Performance Management System (SPMS) for all ECB divisions

Management believes the SPMS proposed for Home Banking will support achievement of strategic goals by:

- Specifying key objectives that management believes will lead to achievement of the fee increase goal
- Developing performance measures for each objective
- Establishing fiscal 2001 goals for the non-financial performance measures intended to lead to the proposed 75% increase in Electronic Banking product revenue in fiscal 2002

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What the Customers Want

Review of feedback from Home Banking customers indicates two factors they value as essential in an Electronic Banking product:

- FUNCTIONALITY: customers want a PC Banking system that provides a wide range of online options including: account inquiries, funds transfers, bill payments, investment purchases and sales.

- SECURITY: customers want the best security available to prevent unauthorized online access to their accounts.

You believe customers are likely to purchase the Electronic Banking product only if both of these requirements are met.

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Human Resources

Developing an Electronic Banking product that meets customer requirements will require programmers that possess specialized technical skills

Your assessment of Home Banking's programmers is that many have not yet received the training necessary for PC Banking system development.

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Home Banking's SPMS

The SPMS proposed by management is presented in the slides that follow

As before

- The SPMS is developed by key factor: Employees; Development Processes; Customer; and Financial
- Objectives, measures and goals are identified for each key factor
- "pop-up" windows are used to explain items where necessary. Place your pointer over a performance measure to see its definition. Where helpful, some goals are also described using pop-up windows.
- "Cause-effect" links among objectives and performance measures are indicated with an arrow. All relationships are positive in nature.

Please proceed carefully through each page.

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SPMS: Employees

	Objectives	Performance Measures	2001 Goals	Rating
Employees	1. Develop strategic skills of Home Banking staff	1.1 Staff training	75%	

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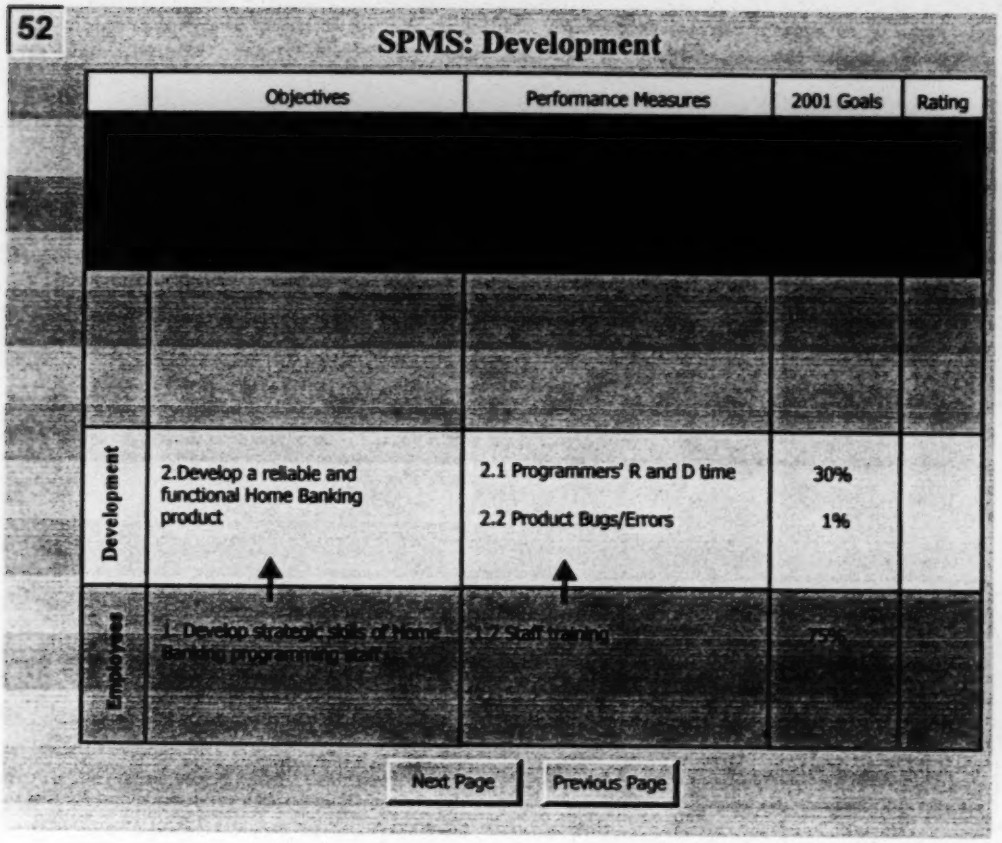
52
SPMS: Development
Objectives
Performance Measures
2001 Goals
Rating
Development
2.Develop a reliable and functional Home Banking product
2.1 Programmers' R and D time
30%
2.2 Product Bugs/Errors
1%
Employees
1. Develop strategic skills of Home Banking programming staff
1.2 Staff training
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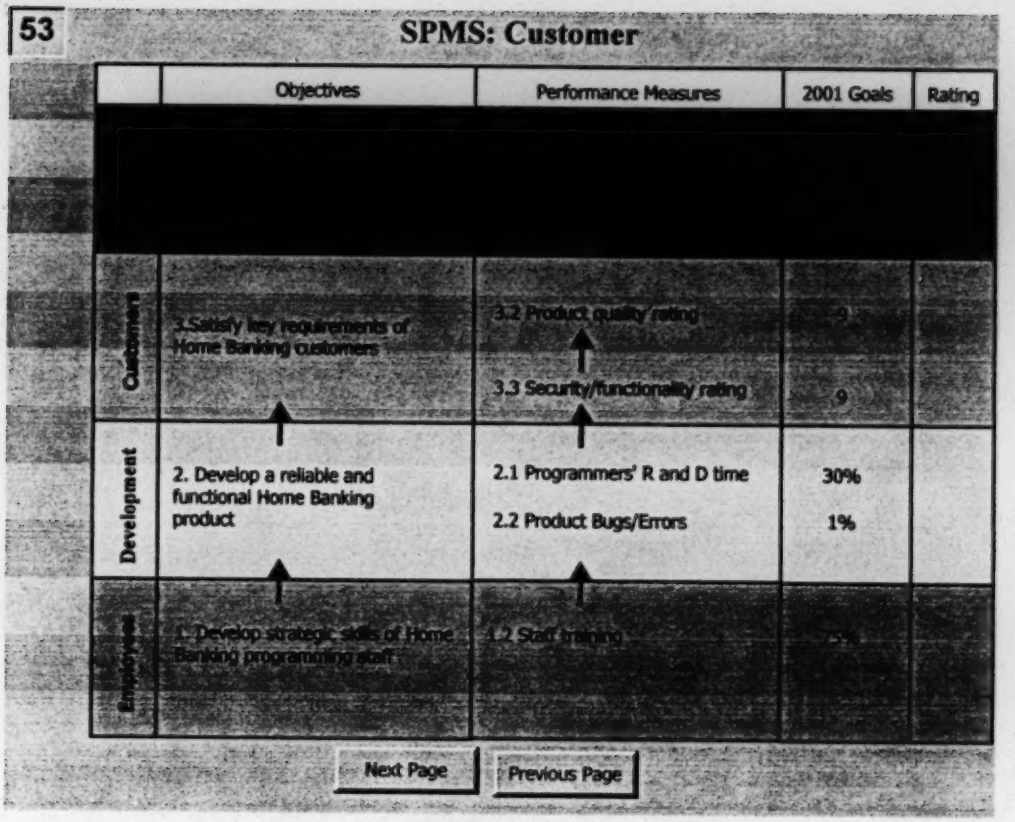
53
SPMS: Customer
Objectives
Performance Measures
2001 Goals
Rating
Customers
3.Satisfy key requirements of Home Banking customers
3.2 Product quality rating
9
3.3 Security/functionality rating
9
Development
2. Develop a reliable and functional Home Banking product
2.1 Programmers' R and D time
30%
2.2 Product Bugs/Errors
1%
Employees
1. Develop strategic skills of Home Banking programming staff
1.2 Staff training
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SPMS: Financial

	Objectives	Performance Measures	Goals	Rating
Financial			2002 Goal	
	4. Increase revenues from sale of Electronic Banking product	4. Growth in Electronic Banking product revenue	75%	
Customers			2001 Goals	
	3.Satisfy key requirements of Home Banking customers	3.2 Product quality rating	9	
		3.3 Security/functionality rating	9	
Development	2. Develop a reliable and functional Home Banking product	2.1 Programmers' R and D time	30%	
		2.2 Product Bugs/Errors	1%	
Employees	1. Develop strategic skills of Home Banking programming staff	1.2 Staff training	75%	

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Case 2: Feedback Part 1

SPMS Page 54

The following items are based on the SPMS presented on Page 54. Please refer to that slide as necessary.

Each statement refers to the SPMS cause-effect relationships management has proposed on page 54.

Based on the facts presented in this case, please indicate whether you think each of the cause-effect relationships proposed in the SPMS is plausible for ECB by ticking one of the boxes.

Place your pointer over the response boxes in the first row to see a description of what each means.

1. According to the Objectives identified in the proposed SPMS:

a. Developing the strategic skills of Home Banking programming staff will lead to development of a reliable and functional product — ☐ Agree ☐ Disagree ☐ Not Sure

b. Development of a reliable and functional product will allow Home Banking to satisfy key customer requirements — ☐ Agree ☐ Disagree ☐ Not Sure

c. Satisfying key customer requirements will lead to an increase in Electronic Banking product revenue. — ☐ Agree ☐ Disagree ☐ Not Sure

2. According to the Performance Measures identified in the proposed SPMS:

a. Training will provide the technical skills necessary to develop a reliable and functional product — ☐ Agree ☐ Disagree ☐ Not Sure

b. Spending time on R and D activities will positively affect product security/functionality ratings. — ☐ Agree ☐ Disagree ☐ Not Sure

c. Security/functionality ratings will positively affect overall product quality ratings. — ☐ Agree ☐ Disagree ☐ Not Sure

d. Overall product quality will lead to growth in Electronic Banking fee revenues — ☐ Agree ☐ Disagree ☐ Not Sure

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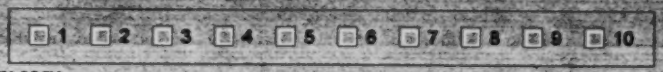
SPMS: Non-Financial Goal Difficulty

Retail Banking Division management has proposed the SPMS non-financial goals shown on the previous page for fiscal 2001 believing they will lead to the 2002 revenue growth goal.

You've considered several issues when determining the appropriate difficulty rating for the non-financial goals: technical expertise required to develop the PC Banking system; the relatively short timeframe in which to meet the goals; and the intense competition in the market.

You have also considered data on industry benchmarks. Comparative figures on the training measure is unavailable but the other non-financial goals represent performance near that of industry leaders.

The goal difficulty ratings shown on the next page are based on the scale below:



very easy very hard

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SPMS: Goal Difficulty Ratings

	Objectives	Performance Measures	Goals	Rating
Financial			2002 Goal	
	4. Increase revenues from sale of Electronic Banking product	4. Growth in Electronic Banking product revenue	75%	9
Customers			2001 Goals	
	3.Satisfy key requirements of Home Banking customers	3.2 Product quality rating	9	9
		3.3 Security/functionality rating	9	9
Development	2. Develop a reliable and functional Home Banking product	2.1 Programmers' R and D time	30%	9
		2.2 Product Bugs/Errors	1%	9
Employees	1. Develop strategic skills of Home Banking programming staff	1. Staff training	75%	9

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Non-Financial Goal Achievability

You've assessed the likelihood of achieving each of the proposed non-financial SPMS goals (excluding the revenue increase goal)

This assessment is based on several factors including:

- Resources required to achieve each of the goals
- Controllability of factors affecting achievement of the goals
- Time required to implement the initiatives necessary to achieve each of the goals

You've also considered the difference between the 2001 goals and estimated performance for 2000. The estimates are shown on the next page.

Based on your previous experience with achieving performance goals at ECB you believe there is a 60% probability of achieving each of the non-financial goals.

The next page presents the proposed SPMS with the goal achievability information included. Place your pointer over the column headings for a description of each. As before, other goals and measures are defined with pop-up windows.

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SPMS: Goal Achievability

	Performance Measures	Estimate*	Goal Level	Goal Rating	Goal Achievability
Financial		2001 Estimate	2002 Goal		
	4. Growth in Electronic Banking product revenue	20%	75%	9	
Customers		2000 Estimate	2001 Goals		
	3.2 Product quality rating	4	9	9	60%
	3.3 Security/functionality rating	4	9	9	60%
Development	2.1 Programmers' R and D time	10%	30%	9	60%
	2.2 Product Bugs/Errors	5%	1%	9	60%
Employees	1. Staff training	25%	75%	9	60%

*Place your pointer over each estimate to see a description

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ECB Incentive Plan

The incentive plan used by ECB was described in Case 1

By way of reminder, the details are as follows:

- Your performance evaluation will be directly influenced by your success in achieving the Electronic Banking revenue growth goal. The strength of your performance evaluation will have a significant impact on your annual bonus.
- For 2002, if you do not achieve the revenue growth goal of 75%, your performance evaluation and bonus will be negatively affected.
- Non-financial SPMS goals will be indirectly rewarded to the extent they lead to achievement of the financial goal

Based on your prior experience with ECB incentive plans, you may assume individual bonuses are significant

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Your Feedback

ECB would again like your reactions to a number of issues including:

- The clarity and usefulness of the information provided by the SPMS proposed by Retail Banking management
- The proposed revenue growth goal of 75%
- The proposed set of non-financial SPMS goals

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Case 2: Feedback Part 2

The following statements are based on the proposed SPMS presented on Page 57. You may find it useful to review page 57 at this time. You may also find it useful to review the statement of customer values and the employee skill necessary to deliver on those values.

Customer Values | Employee Skills | SPMS Page 57

1. The SPMS identifies non-financial Objectives that should lead to the objective of increasing Electronic Banking revenue.

strongly disagree — neutral — strongly agree

☐ -5 ☐ -4 ☐ -3 ☐ -2 ☐ -1 ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2. The SPMS identifies a set of non-financial Performance Measures that should lead to the goal of increasing Electronic Banking revenue by 75% in 2002.

strongly disagree — neutral — strongly agree

☐ -5 ☐ -4 ☐ -3 ☐ -2 ☐ -1 ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

3. How strong would you rate the link between performance on the non-financial measures identified in the proposed SPMS and growth in Electronic Banking revenues?.

Very Weak — Very Strong

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7

4. How controllable do you believe the set of non-financial performance measures is (i.e. how much influence do you believe you would have on the outcomes)?

Not at all controllable — Very controllable

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7

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Case 2: Feedback Part 3

The following questions relate to the SPMS presented on page 59. You may find it useful to review page 59 at this time.

SPMS Page 59

1. I believe the goals for the proposed set of non-financial Performance Measures (excluding Electronic Banking revenues) are difficult.

strongly disagree — neutral — strongly agree

☐ -5 ☐ -4 ☐ -3 ☐ -2 ☐ -1 ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2a. Do you believe the proposed goals for the set of non-financial Performance Measures (excluding the Electronic Banking revenue goal) can be achieved?

☐ Yes ☐ No

2b. Please indicate your estimate of the probability of achieving the set of non-financial performance goals:

_____ %

3. Given the reward system in place at ECB, please indicate how attractive it would be for you to achieve the goals for the set of non-financial performance measures proposed by management? (remember these non-financial goals have been proposed because management believes they wll lead to attainment of the revenue growth goal)

You may find it helpful to review the details of ECB's reward system.

Incentive Plan

very unattractive — neutral — very attractive

☐ -5 ☐ -4 ☐ -3 ☐ -2 ☐ -1 ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

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Case 2: Feedback Part 4

The following items seek your reactions to the goals for the proposed set of non-financial Performance Measures on Page 59.

When responding, remember these non-financial performance measures and goals have been proposed by management because they believe they will lead to the financial goal of increasing Electronic Banking revenues by 75% in 2002. However, you are encouraged to express your views as to their appropriateness.

SPMS Page 59

1. I would care if I achieved the goals for the proposed set of non-financial Performance Measures.

strongly disagree — neutral — strongly agree

-5 -4 -3 -2 -1 0 1 2 3 4 5

2. It would take a lot to make me abandon the goals for the proposed set of non-financial Performance Measures.

strongly disagree — neutral — strongly agree

-5 -4 -3 -2 -1 0 1 2 3 4 5

3. I think the goals for the proposed set of non-financial Performance Measures would be good goals to strive for.

strongly disagree — neutral — strongly agree

-5 -4 -3 -2 -1 0 1 2 3 4 5

4. I would be strongly committed to pursuing the goals for the proposed set of non-financial Performance Measures.

strongly disagree — neutral — strongly agree

-5 -4 -3 -2 -1 0 1 2 3 4 5

5. I would be willing to put in a great deal of effort to achieve the goals for the proposed set of non-financial Performance Measures.

strongly disagree — neutral — strongly agree

-5 -4 -3 -2 -1 0 1 2 3 4 5

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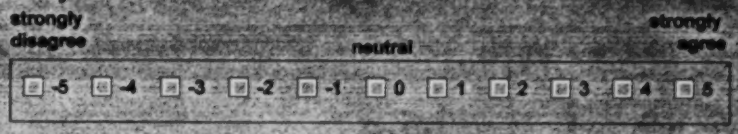
Case 2: Feedback Part 5

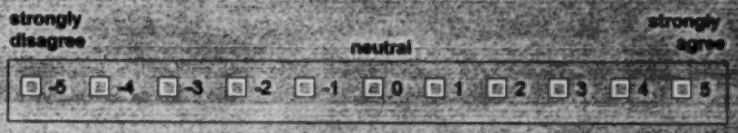
On the previous page you responded to a series of questions about the proposed goals for the set of non-financial performance measures. Now your reactions to the proposed financial goal of increasing Electronic Banking revenue by 75% in 2002 are being sought.

Responses should be based only on the case information and your assessment of the usefulness of the proposed SPMS in achieving the goal. Again you are reminded that the revenue growth goal for 2002 has only been proposed by management and you are encouraged to express your own views as to its appropriateness.

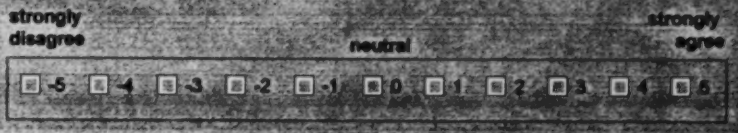
1. I would care if I achieved the goal of increasing Electronic Banking revenue by 75%.



2. It would take a lot to make me abandon the goal of increasing Electronic Banking revenue by 75%.



3. I think the goal of increasing Electronic Banking revenue by 75% would be a good goal to strive for.



4. I would be strongly committed to pursuing the goal of increasing Electronic Banking revenue by 75%.

5. I would be willing to put in a great deal of effort to achieve the goal of increasing Electronic Banking revenue by 75%.

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66 **Case 2: Feedback Part 5 continued**

6. If I were to use the proposed SPMS to manage the E-Commerce department, I believe Electronic Banking revenues could be increased in 2002 by:

		Indicate your estimate of the % probability of achieving each goal level (0-100):
(a) 45%	☐ Yes ☐ No	____ %
(b) 55%	☐ Yes ☐ No	____ %
(c) 65%	☐ Yes ☐ No	____ %
(d) 75%	☐ Yes ☐ No	____ %
(e) 85%	☐ Yes ☐ No	____ %

7. Based on the information presented in the case, I believe the goal of increasing Electronic Banking revenue in 2002 should be set at:

☐ 35% ☐ 45% ☐ 55% ☐ 65% ☐ 75% ☐ 85% ☐ 95% Other: Please specify ____ %

8. Given the reward system used at ECB, how attractive is the goal of achieving the 75% increase in Electronic Banking revenue?

very unattractive — neutral — very attractive

☐ -5 ☐ -4 ☐ -3 ☐ -2 ☐ -1 ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

9. Your bonus for fiscal 2002 at ECB will be directly affected by your success in achieving the 75% increase in Electronic Banking revenue.

strongly disagree — neutral — strongly agree

☐ -5 ☐ -4 ☐ -3 ☐ -2 ☐ -1 ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

10. Performance on non-financial measures is rewarded at ECB to the extent they contribute to achievement of the financial goals.

strongly disagree — neutral — strongly agree

☐ -5 ☐ -4 ☐ -3 ☐ -2 ☐ -1 ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

YOU HAVE NOW COMPLETED ALL REQUIREMENTS FOR CASE 2. ON THE NEXT 2 PAGES YOU WILL BE ASKED A FEW FINAL QUESTIONS ABOUT YOUR BACKGROUND AND THE MATERIALS YOU HAVE JUST COMPLETED. PLEASE PROCEED.

Final Questions

Final Questions: Part 1

1. Within your organizations, do you have responsibility for achieving performance targets either as part of a group (e.g. team, department, division, etc.) or individually?

☐ Yes ☐ No

2. Does your organization use a performance measurement system with similarities to the systems described in the Cases?

☐ Yes ☐ No

3. How many years has your company been using the system? (if you answered "no" to 2 above, tick "not applicable")

○ 1 or less ○ 2 ○ 3 ○ 4 ○ 5 ○ More than 5 ○ Not applicable

4. How would you rate the overall usefulness of the system? (if you answered "no" to 2 above, tick not applicable)

Not very useful						Very useful	
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ Not applicable

5. Please rate your performance as a manager on the following tasks:

	well below average			average			well above average
a. Planning	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
b. Investigating	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
c. Coordinating	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
d. Evaluating	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
e. Supervising	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
f. Staffing	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
g. Negotiating	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
h. Representing	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
i. Overall Performance:	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

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Final Questions: Part 2

6. In your opinion, how realistic were the two cases:

Not realistic at — Very realistic

1 2 3 4 5 6 7

7a. How understandable were the materials?

Not at all understandable — Very understandable

1 2 3 4 5 6 7

7b. How difficult was it to complete the materials?

Not difficult at all — Very difficult

1 2 3 4 5 6 7

7c. How familiar are you with the electronic commerce settings presented in the two cases?

Not familiar at all — Very familiar

1 2 3 4 5 6 7

7d. How much work experience do you have with the type of electronic commerce settings presented in the two cases?

No experience — Extensive Experience

1 2 3 4 5 6 7

8. Relative to other managers in your organization, how would you rank your overall managerial ability? (rounded to the nearest percent - e.g. top 5%, top10%, etc.)

Top [ ] %

9. Please indicate the range of probabilities you would assign to performance goals with a low, moderate, or high likelihood of achievement (e.g. low: lower = 10%, upper = 30%)

Probability	Range: Lower	Range: Upper
Low		
Moderate		
High		

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Appendix 2

Contact Letter

Purpose of the Study and Contact Information

~ You have been asked to participate in a research project that is part of the requirement for my (Alan Webb) PhD degree. The purpose of this project is to develop a better understanding of the impact of performance measurement systems.

~ This research is being conducted in accordance with University of Alberta standards for protection of human research participants. If you have any general concerns or questions about this project please contact:

Dr. Michael Gibbins, University of Alberta: 780-492-2718; mgibbins@ualberta.ca
or
Dr. Royston Greenwood, University of Alberta: 780-492-2797;
royston.greenwood@ualberta.ca

Requirements

~ You will be required to answer a series of questions based on your reactions to information presented in two hypothetical cases. All materials will be administered via the internet.

~ It will take about 70 minutes to work through the entire set of materials. Please try to block off a period of uninterrupted time to complete the task.

~ Please work independently and do not discuss the materials with other members of your organization who have agreed to participate in the research.

Confidentiality of Responses and Terms of Participation

~ To ensure confidentiality of responses: (1) results will only be reported in aggregate, not by individual respondents; (2) the only copy of the materials will be kept on my computer and will be deleted 5 years after publication of my research; and (3) access to results will be limited to the members of my dissertation committee, subject to the confidentiality details outlined in this paragraph.

~ Your participation in this project is entirely voluntary. You are free to discontinue your involvement at any time without completing the materials.

~ Completing the materials will be considered evidence of your consent to participate.

~ If you have any questions regarding the foregoing details and instructions you may contact me, Alan Webb, at: 519-888-4567 ext. 6548 or email me at *a2webb@uwaterloo.ca* If you would like a summary of the results please contact me as per the information above.